MARCH 9, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

TRADE ASSOCIATIONS
How To Grow with Them

Are you getting the most benefit out of your trade association? See page 76

✓ STEEL WAREHOUSES
Still Plagued by Imbalances, p. 65

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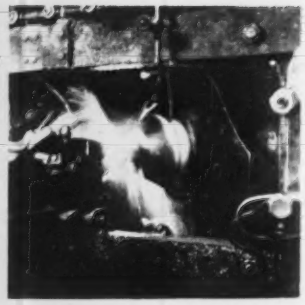
B & W BULLETIN 6-F

Properties of Carbon, Alloy and Stainless Steel Tubing for High-Temperature and High-Pressure Service



The Story of the Croloys

New data contained in the seventh, revised edition of B&W's Technical Bulletin 6-F make it must reading for technical personnel concerned with the properties of tubing for high-temperature and high-pressure service. TB-6F contains up-to-the-minute information on:

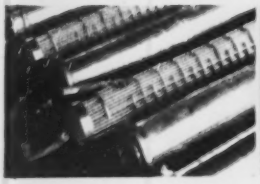
- Requirements of Tubing for High-Temperature Service
- Influence of Alloying Elements
- Chemical Composition
- Room-Temperature Properties
- Short-Time Tensile Properties
- Stress-Rupture
- Creep
- Thermal Expansion
- Thermal Conductivity
- Impact Properties
- Microstructure—Transformation Temperatures
- Air-Hardening Properties
- Effect of Hydrogen
- Common Causes of Tube Failures
- Upset, Formed and Machined Tube Ends

On such grades as

B&W	NOMINAL ALLOY CONTENT	MAXIMUM SERVICE TEMPERATURE
Carbon Steel (Killed)		
Carbon-Moly	0.50% Mo	1050F
Croloy ½	0.60% Cr 0.50% Mo	1075F
Croloy 1	1% Cr ½% Mo	1150F
Croloy 1¼	1.25% Cr 0.50% Mo	1100F
Croloy 2	2% Cr 0.50% Mo	1150F
Croloy 2¼	2.25% Cr 1.00% Mo	1175F
Croloy 5-M	5% Cr 0.90% Mo	1175F

B&W	NOMINAL ALLOY CONTENT	MAXIMUM SERVICE TEMPERATURE
Croloy 5	5% Cr 0.50% Mo	1200F
Croloy 5-Si	5% Cr 0.50% Mo 1.50% Si	1300F
Croloy 7	7% Cr 0.50% Mo	1250F
Croloy 9-M	9% Cr 1% Mo	1300F
Croloy 16-13-3	16% Cr 13% Ni 3% Mo	1600F
Croloy 18-8	18% Cr 8% Ni	1600F
Croloy 25-20	25% Cr 20% Ni	2100F

Write for your copy —on company letterhead, please.



Chemical

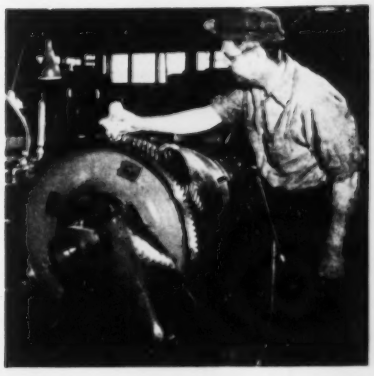
Oil

Power

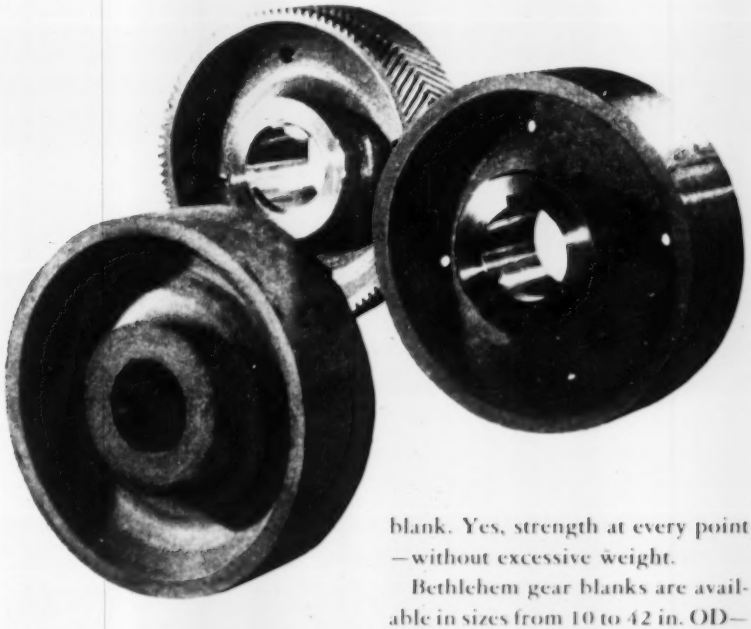
TA-1739 (F)

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



YES, IT IS POSSIBLE...
HIGH-STRENGTH GEAR BLANKS
without EXCESSIVE WEIGHT



Whenever we ask a customer what he rates highest in a gear blank, he usually answers "Strength." Sometimes he'll add as an afterthought, "Strength, yes. And when I can get a heavy-duty blank without a lot of extra weight, so much the better. That's a real advantage."

Bethlehem is turning out that kind of gear blanks every working day of the year. Blanks for spur, bevel, miter, herringbone, and other types of gears. Strong, sturdy, durable blanks for gears that will carry the wickedest loads. Yet they are not encumbered with pounds and pounds of excess weight that can frequently cause some genuine problems for the machine-designer.

How is this possible?

One important factor is Bethlehem's unique manufacturing process. At Bethlehem, the blanks are forged and rolled, with the attendant benefits of *both* operations. What's more, forging and rolling are combined in a single step that gives better grain flow.

As a result, there's high homogeneity and strength in the finished blank. Yes, strength at every point—without excessive weight.

Bethlehem gear blanks are available in sizes from 10 to 42 in. OD—treated or untreated, as you specify. Ask for full details and a copy of illustrated Booklet 216.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor—Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-and-FORGED CIRCULAR PRODUCTS

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RECORD: Philgas is being used successfully by many of the nation's leading manufacturers for almost any operation where a uniform, clean, easily-controlled heat is needed. Many progressive utilities, too, are supplementing their output of natural or manufactured gas with dependable Philgas. It's America's largest selling brand of LP-Gas!

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

PHILLIPS PETROLEUM COMPANY
Sales Department · Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kans.

Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give 5% more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched. ... After six months of 24 hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs ..."

There are hundreds of cases like these.

They cost no more

BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,235,994).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V-Belts BY

B.F.Goodrich

FIRST IN RUBBER

The B. F. Goodrich Company
Dept. S-3
Akron, Ohio

[ ] Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

[ ] Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

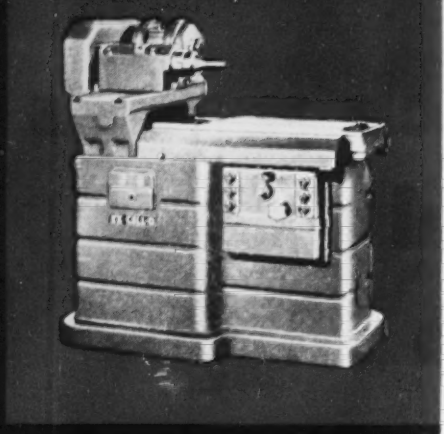
Name

Firm Name

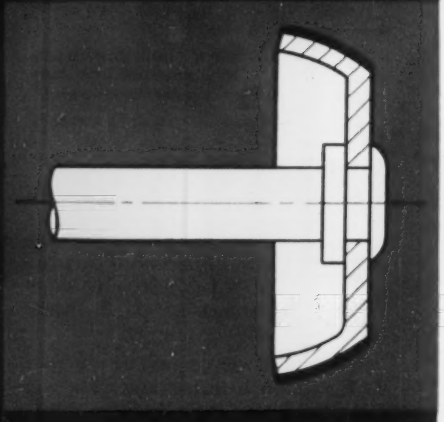
Street Address

City

State



Ex-Cell-O Style 2112-A Precision Boring Machine.



Partial sectional view of assembly shows the operation in heavy lines.

Precision Turning

ON AN EX-CELL-O BORING MACHINE

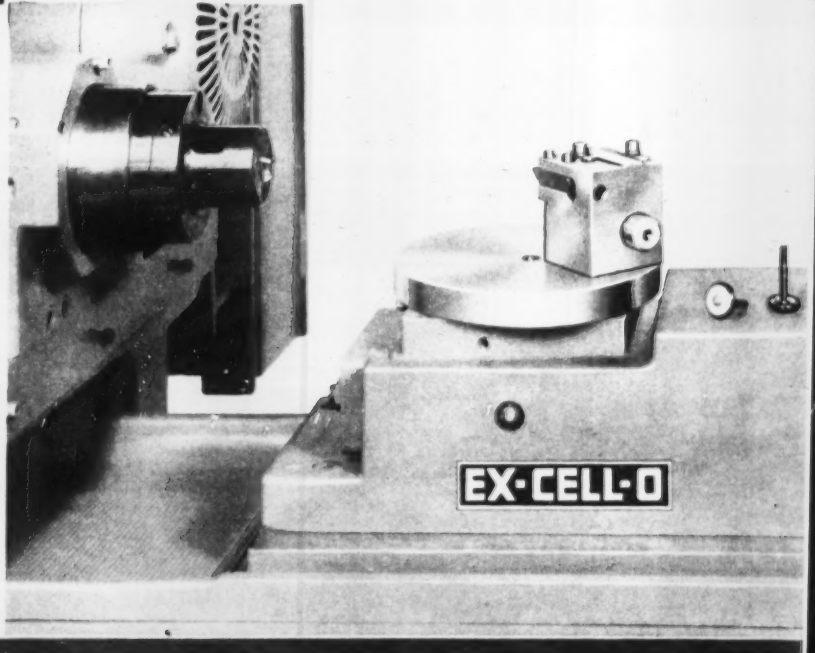
Accurate Radii Turned at High Speed on Stainless Valve Plunger Assemblies

There are many jobs on Ex-Cell-O Precision Boring Machines that have nothing to do with boring. For example, here's a Style 2112-A single-end machine equipped for precision turning the radius on a valve and stem assembly.

The stainless steel assemblies are held in a collet chuck on the spindle. The turning tool is held in a tool block on a turret which is actuated by a hydraulic cylinder through a rack and pinion. Net production is 109 pieces per hour.

For further information on the many uses to be made of Ex-Cell-O Precision Boring Machines, see your local Ex-Cell-O representative or write for Bulletin 31205.

Close-up of spindle and tool block on Ex-Cell-O Style 2112-A Precision Boring Machine equipped for precision turning an accurate radius.



XLO

EX-CELL-O PRECISION

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DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 132 No. 10 Mar. 9, 1952

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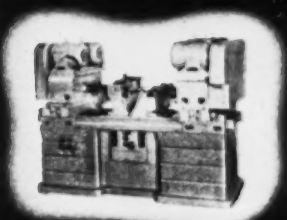
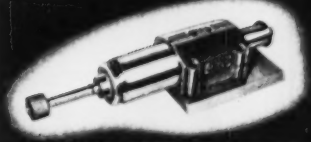
XLO
EX-CELL-O for PRECISION

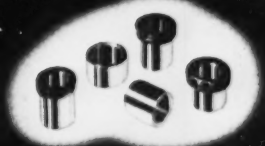


PRECISION MACHINE TOOLS

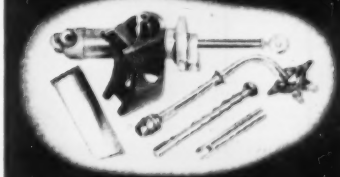
CONTINENTAL CUTTING TOOLS



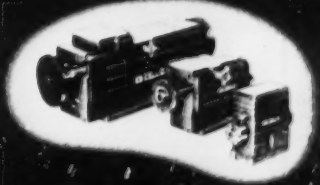
PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS



AIRCRAFT AND PRECISION PARTS



HYDRAULIC POWER UNITS

Products of

EX-CELL-O

CORPORATION

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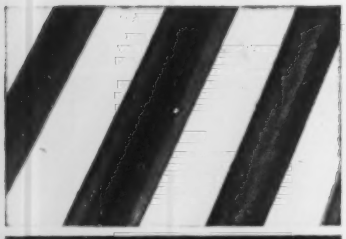

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Users of Acadia Synthetic Rubber component parts in hundreds of industries have found them unsurpassed. No matter what function synthetic rubber must perform, depend on Acadia parts. They best meet exacting specifications and operating conditions such as moisture, oil, heat, wear and age resistance. Molded, extruded, die-cut to close limits—compounded to meet specific conditions. Acadia engineers will gladly cooperate.

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Behind the Scenes...

Miserable Skunks

One of the darndest addresses we've seen in a long time is on the letterhead of Specialties, Inc., whose Paul H. Reiser this week wrote in about Specifications Handbook. They are located on *Skunks Misery Road, Syosset, Long Island.*

Bouquets Galore

Incidentally, the comments that are piling in every day on the Specifications Handbook are enough to warm the cockles of everyone's heart who even had the least little bit to do with the creation of it. Just listen:

Unquestionably the finest and most complete publication of specifications I've ever seen. . . very grateful. . . certainly arranged for easy reference . . . of great value to our engineers . . . very excellent and much needed publication. . . of real benefit. . . an indispensable tool. . . best source of information published. . . very helpful . . . been hunting this for years. . . a real service to the industry. . . finest thing ever developed. . . excellent reference. . . exactly what we have needed. . . congratulations on making this available. . .

Yes, it is true that every subscription to STEEL entered during the year will receive a copy of the Handbook free of charge.

Iss Swiss

Since our grandpappy came from Switzerland we got a particular kick out of the story one of our good readers from Milwaukee told on himself when he stopped in to say hello the other day. Seems he just got back from a trip abroad during the course of which he had made a special trip to Switzerland to pick up some of his favorite delicacy—cheese. At his first meal in the hotel he asked for "Swiss cheese", noticed the waiter's confusion and then realized that in Switzerland all cheese is naturally "Swiss". After an elaborate explanation, the light finally dawned and the waiter smiled. "Iss Emmenthaler", he said, and served our friend a huge slice. It really was excellent, and our connoisseur praised it lavishly. "Iss very special," said the delighted waiter, "What you call comport." He paused, then proudly proclaimed, "Eet come from Wees-consin!"

Collector's Item

Ever since the Universal Match Company delivered our new supply of match books some months ago, we felt they were most attractive but we didn't realize just how attractive until Earle B. Lafean of Pittsburgh wrote us the other day. It seems that Mr. Lafean is an officer in an organization whose purpose in life is the collection of paper match books. They meet quarterly in different cities of every state and their next national convention is slated for Richmond, Virginia this coming September. We are happy to send along an ample supply of STEEL book matches to be distributed at their next meeting. Incidentally, if you would like a handful for yourself, or for your kid's collection, let us know and we will get them off to you pronto.

Autosyncracies

What make car do you drive? If it's a Buick, you're right in style. At least that's the car most STEEL readers have, according to a recent survey conducted by our Market Research Department. A cross-section of 1350 readers of STEEL came up with this list of cars:

1. Buick	262 readers
2. Ford	221 readers
3. Chevrolet	215 readers
4. Plymouth	130 readers
5. Chrysler	106 readers
6. Dodge	99 readers
7. Pontiac	97 readers
8. Cadillac	87 readers
9. Mercury	69 readers
10. Studebaker	58 readers

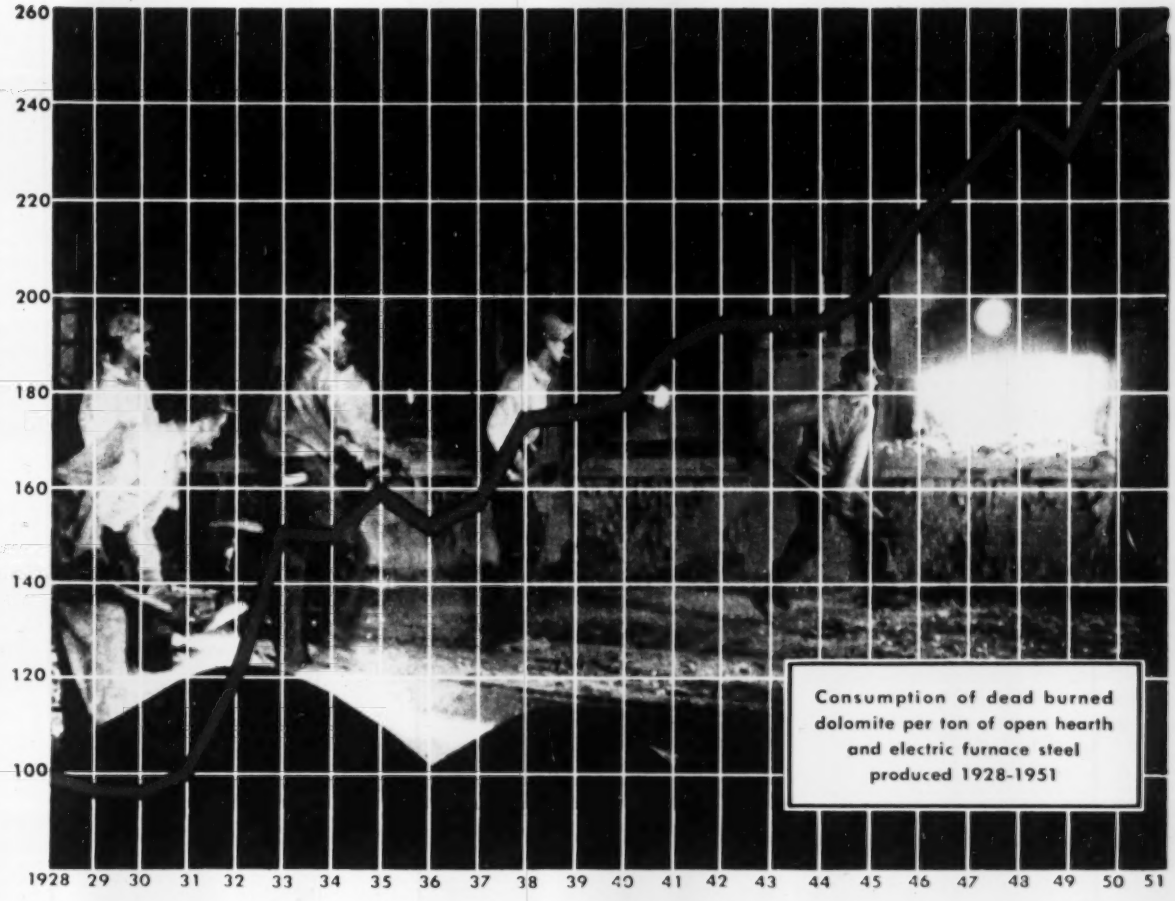
One out of three of you has another car for the little woman to get the kids over to school and to do her shopping with, and a few characters have a three-car garage that's full!

Puzzle Corner

Those trains that we told you about last week are still racing from New York to Chicago and back again so we'll give you another week to work on it.

Shrdlu

(Metalworking Outlook—Page 57)



just what is dead burned dolomite?

IT is a hearth maintenance refractory made from a relatively inexpensive raw material (dolomite). Under properly controlled manufacturing processes, dead burned dolomite develops certain inherent qualities advantageous to efficient, low cost maintenance—qualities which have led to a steadily widening acceptance by the steel industry.

Typically, dolomite suitable for dead burning shows a chemical analysis of lime 30.4%, magnesia 21.6%, silica 0.3%, other oxides 0.2% and carbon dioxide 47.5%. Prior to dead burning, quarried dolomite is classified to proper sizes and the very fine particles, along with clay and silt, are removed by washing.

The sized, washed dolomite granules, proportioned with a small percentage of iron oxide, travel through rotary kilns heated to above 3000°F. As they pass through the hot gases, the particles are first calcined, giving up approximately half their weight of carbon dioxide, and then sintered and shrunk to dense, hard clinkers. High temperature reactions convert calcium oxide to crystalline lime and magnesium oxide to periclase. Some lime also combines with iron oxide and silica to serve the refractory as a bonding agent.

The resultant product has been variously called "double burned", "roasted", "sintered", "clinkered", "prepared", "black" and "dead burned" dolomite. Of these designations, dead burned is now the generally accepted term, indicating as it does the characteristic hard, dense, inert, crystalline, highly refractory quality of the material.

Dependable dead burned dolomite, marketed under the well-known trade names Magnefer and Syndolag, is manufactured by Basic Refractories at its Ohio Works—recently expanded to meet the industry's ever increasing use of this refractory.

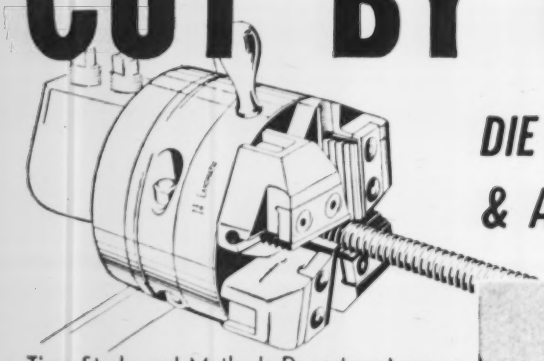
GRANULAR BASIC REFRACTORIES

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

THREADING COSTS CUT BY OVER 75%



DIE HEAD CUTS COST OF PRODUCTION & ASSEMBLY OF STABILIZER SCREWS

Time Study and Methods Department records of a large aviation equipment company furnish data of still another job where LANDMATIC Heads have effected large savings in machine time and assembly and improvements in product quality.

In this operation, the 1¼" LANDMATIC Head on a turret lathe equipped with Leadscrew is cutting a ⅝-6 Acme thread on a Stabilizer Screw used by a light aircraft manufacturer. The thread was held to the close tolerance of ± .001 between the P.D. of the thread and the O.D. of the screw, for a full thread length of 5⅜" on cold-drawn piston stock, Spec. #AISI, B1112.

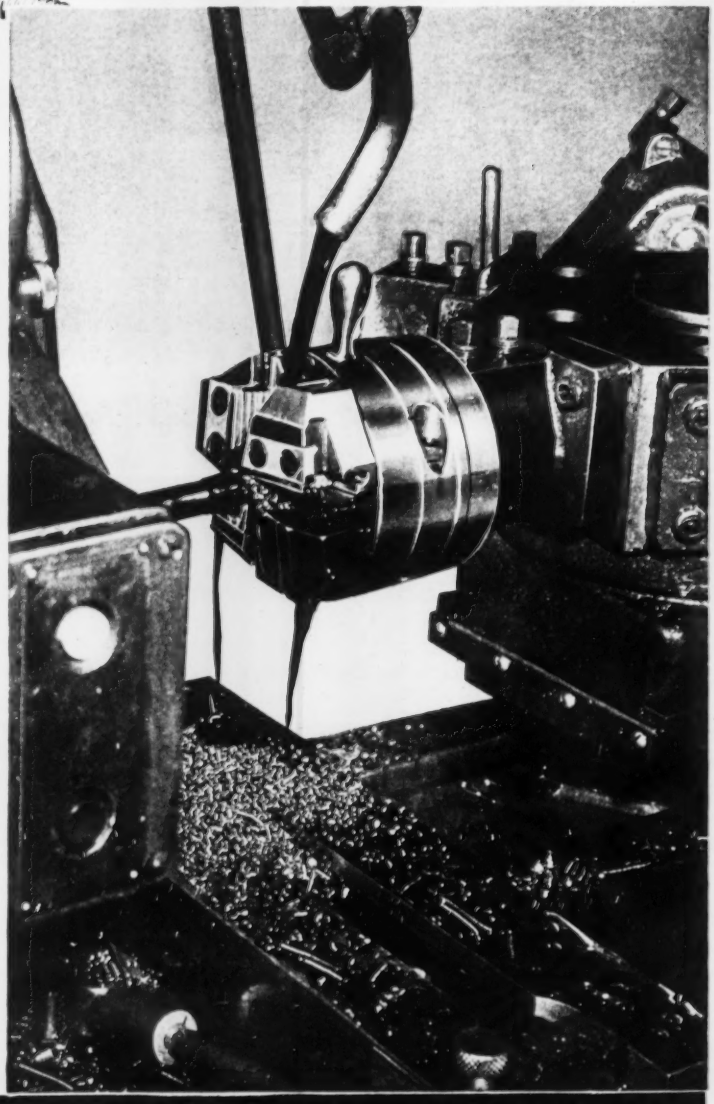
Former methods required two passes to produce the finished thread—one roughing and one finishing cut. The thread is now cut in one pass in .192 at a spindle speed of 230 R.P.M. Approximately 3500 pieces are cut between chaser grinds. Hand fitting with the mating nut in assembly, previously necessary, has been eliminated. Total cost savings in all operations are in excess of 75%.

LANDMATIC Heads are stationary threading heads with self-opening action designed primarily for turret lathes. Their unusually-large oversize capacity makes them ideally suited for these machines.

For information and specifications, write for Bulletins F-80 and F-90.

50th ANNIVERSARY

LANDIS Machine COMPANY
WAYNESBORO, PENNA



THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

The New Louisiana Purchase

EVERY day America crosses a frontier—the frontier of a new market. It is the market created by an ever growing population. Since Pearl Harbor, our population has increased 23½ millions—more than all the people now living in the region west of the Mississippi once called the Louisiana purchase, that vast billion-acre area which provided us with geographical frontiers for a hundred years.

During 1952, 8,500 babies were born daily, increasing our population by nearly 3,000,000 people. New families and bigger families need more and bigger houses, more food, clothing, cars, roads, hospitals, churches, schools. Their needs call for continuing and increasing production from farms and factories.

There are those among us who say a decline in government spending will bring depression. But where is there room for depression when we add the population of another Minnesota or an Iowa to our nation each year—when the need for goods and services increases steadily? In fact, only by tapering off our vast programs of government spending can industry and business hope to provide sufficient goods to maintain our present standard of living and satisfy the demands of our ever growing population.

Let no one tell you America has crossed its last frontier.

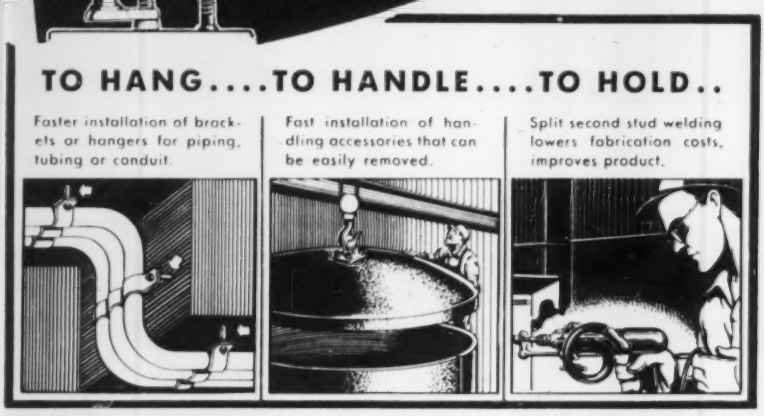
QUALITY YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

END-WELDS STUDS TO STEEL IN A SPLIT-SECOND
ELIMINATES DRILLING, TAPPING, HAND WELDING
REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK
SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES
IMPROVES PRODUCT DESIGN AND QUALITY
TAKE ADVANTAGE OF
NELWELD COST SAVINGS
IN STEEL FABRICATION


TO HANG....TO HANDLE....TO HOLD..
Faster installation of brackets or hangers for piping, tubing or conduit.
Fast installation of handling accessories that can be easily removed.
Split second stud welding lowers fabrication costs, improves product.

THE NELSON FASTENING ENGINEER WILL SHOW YOU

... right in your own plant how your production and your products can be improved with this modern fastening method. Your design and production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

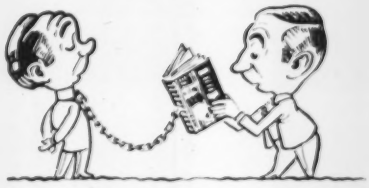
Fasten it Better... at Less Cost, with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS
TO THE EDITORS

Specs Handbook Proves Value



We are in receipt of a copy of your Specifications Handbook which was sent to us as a subscription bonus. We wish to thank you for this handbook, and compliment you on the completeness and the valuable references contained therein . . .

C. H. Proffen
secretary
Charles T. Brandt Inc.
Baltimore

Have received my copy of the Specifications Handbook, which is of untold value to me. I have used it every day since receiving it.

P. T. Reilly
10412 Brighton Rd.
Cleveland

. . . . we think it is one of the finest things which could have been published for steel warehouses.

J. H. Rayfield
Steel & Tube Department
F. M. Tull Metal & Supply Co. Inc.
Atlanta

We sincerely appreciate our copy. It is most complete and we want to express our sincere thanks.

M. G. Henderson
district sales manager
Youngstown Sheet & Tube Co.
Boston

Machine Problem Posed

The sales department of STEEL suggested we contact you relative to a machine problem we are having for the Air Corps on a subcontract basis.

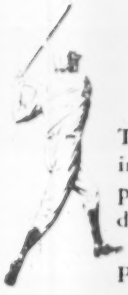
Our problem: Boring a $2\frac{1}{4}$ inch, type 304, stainless steel tube by removing approximately 0.015 to 0.018 per side. The tubes are from 19 to 23 inches long. We have to have 100 to 125 micro finish and can have 0.005 to 0.008 taper. We have used all reputable brands of tool bits. All these break. Any suggestions you have will be greatly appreciated.

E. F. Otis
Unit Manufacturing Co.
Minneapolis

● *At this distance it is difficult to pinpoint the source of your trouble. A long distance guess would be that your operation could offer an acute problem of tool chatter and vibration. An excessive condition of this kind could lead to tool breakage. Perhaps the use of a piloted boring bar with the possible addition of a roll support for steadying the workpiece would eliminate or at least*

Dave O'Leary, Shop Superintendent, and Joe Koehn, Fitting Shop Foreman, look over a blueprint in the Heyl & Patterson Fitting Shop. Both men are 30-year veterans with Heyl & Patterson.

"Old Pros" with the "FOLLOW THROUGH" that counts!



The "Follow-Through" is one of the many ingredients that contributes to the successful performance records of Heyl & Patterson designed, fabricated and erected equipment.

Here is a picture snapped in the Heyl & Patterson Fitting Department. It's a "natural" showing how our shop men "follow-through" from the original designs of our Engineering Department. Compare the picture of these "Old Pros" with the "Follow-Throughs" you have seen on TV in batting scenes from the World Series in baseball and the important winning forward passes in pro-football games. The Heyl & Patterson "follow-through" is possible because we have our own Engineering Department, our own Fabricating Department, our own Machine Shop, our own Erection Department.

The H & P Engineering Department calls the signals and the other H & P Departments know how to "Follow-Through." This is why Heyl & Patterson can guarantee long-life, low-cost performance of Heavy Bulk Materials Handling Equipment.

Heyl & Patterson, Inc.

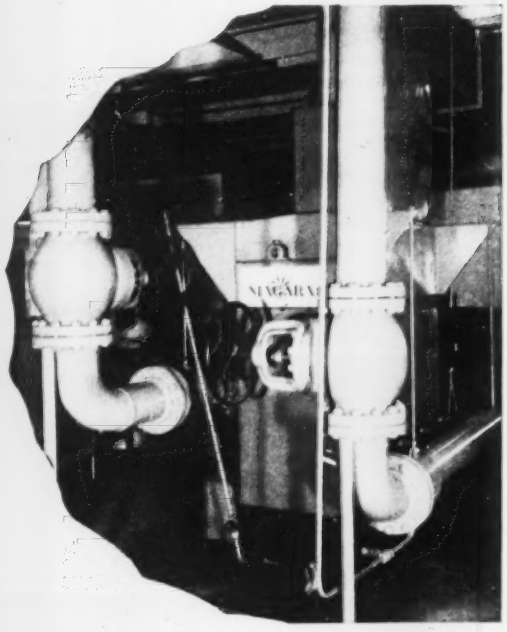
"SINCE 1887"

Heavy Bulk Materials Handling Equipment

All The Way from Design to Erection

55 WATER STREET · PITTSBURGH 22, PA.

How to get drier or cooler air or gases . . .



NIAGARA AERO AFTER COOLER cools a compressed gas, or air, below the temperature of the surrounding atmosphere, thus preventing the condensation of moisture in your lines. The gas will contain only half of the moisture left in it by conventional methods. Even drier gas can be produced if you require it.

In working with controlled atmospheres of inert gases to prevent undesired reactions, this dryness of the gas at low cost is a great advantage. The cost of the Niagara method is low because it uses evaporative cooling, saving 95% of the cost of cooling water (and its piping and pumping). This direct saving of cost pays for the Niagara cooler in less than two years.

If you use compressed air to operate tools or pneumatic equipment you save much in water and oil damage to tools and equipment, and in water damage to materials by using the Niagara Aero After Cooler.

Write for a bulletin, or ask nearest Niagara Field Engineer if you have a problem involving the industrial use of air.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced Field Engineers in Principal Cities of U. S. and Canada

LETTERS

Concluded from preceding page

alleviate the chatter problem. Speed and feed information as well as specifications for the carbide grade could be obtained from the representative of any reliable carbide maker.—ED.

Only Fool's Gold

In your article "Hunt on for Germanium" (Feb. 9, p. 118) you note that this metal is 65 per cent more than the price of gold. Don't you mean of?

I. H. Steinsapir
vice president
Standard Emblem Jewelers
Pittsburgh

• *You're right. Germanium is 65 per cent of the price of gold. Thanks for pointing out this error.—ED.*

How Smooth Is a Surface?

We have noticed with interest your article entitled "How You Can Specify Surface Finishes" (Jan. 19, p. 74). We would appreciate receiving six reprints of that article for use in our engineering department.

L. A. Camerota
chief engineer
Florence Pipe Foundry & Machinery Co.
Florence, N. J.

. . . please send me a reprint.

L. E. Pearson
engineering research department
Crompton & Knowles Loom Works
Worcester, Mass.

. . . we would like ten copies.

E. R. Lawson, assistant manager
Contract Engineering
Lewis Machinery Division
Blaw-Knox Co.
Pittsburgh

• *Sent.—ED.*

Waste Recovery Gets a Boost

We would very much like to receive a reprint of the article "Ion Exchange—New Hope for Waste Recovery (Oct. 20, p. 96) by Dr. Allen G. Gray, Technical Editor of STEEL.

A. Stukis
Gravery Water Conditioning Co.
New York

• *Sent.—ED.*

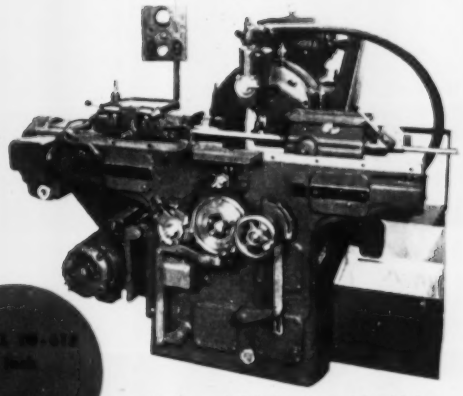
We read with considerable interest your article "Ion Exchange—New Hope for Waste Recovery." Since you don't mention the materials of construction, we are wondering if you can tell us whether or not lead is used in the ion exchange systems used in brass pickling, tin plating and copper-nickel-chromium plating. We do know that lead is used in phosphoric acid pickling operations. With this information at hand we would like to do another story for our own publication describing these particular applications. Whatever help you can give will be appreciated.

K. H. Roll
Lead Industries Association
New York

• *For more complete information on equipment used in ion exchange processes, write to Permutit Co., 330 West 42nd Street, New York 18, and Illinois Water Treatment Co., Rockford, Ill. —ED.*

Quality threading

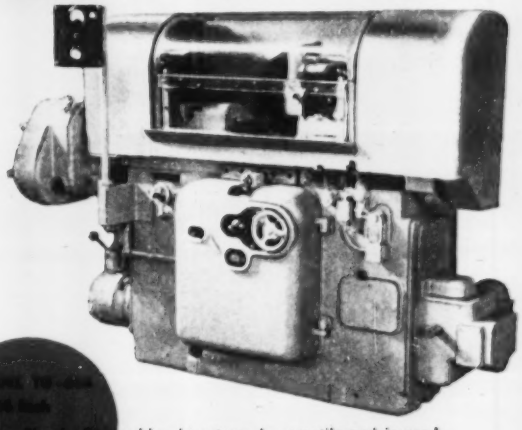
AT MINIMUM COST



utomatic Thread Grinder is used for high
h thread grinding with either single or multi-
wheels on relatively small parts.

JONES & LAMSON
AUTOMATIC THREAD GRINDERS:

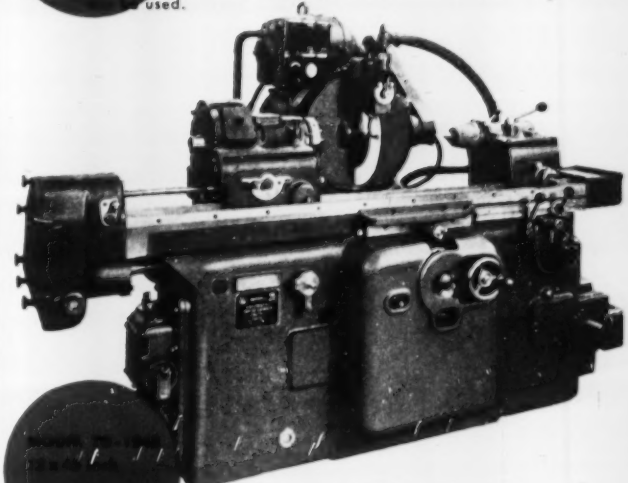
- Produce threads of better quality and more uniform finish
- Reduce handling cost
- Eliminate costly rethreading after heat treatment
- Eliminate expensive retooling when specifications change
- Reduce cost of gage maintenance



achine is extremely versatile and is used
short run jobs on a great variety of preci-
dded parts. Single or multi-ribbed wheels
used.

Built-in accuracy and automatic features, make any of these machines a paying investment for toolroom or production line.

- Automatic wheel truing
- Automatic infeed on successive cuts
- Automatic sizing
- Rheostat wheel speed control
- Diamond or crush dressing of wheels
- Multi-ribbed threading
- Right and left hand threading



achine is used for grinding threads on a
e of work from small to large heavy parts.
r multi-ribbed wheels can be used.

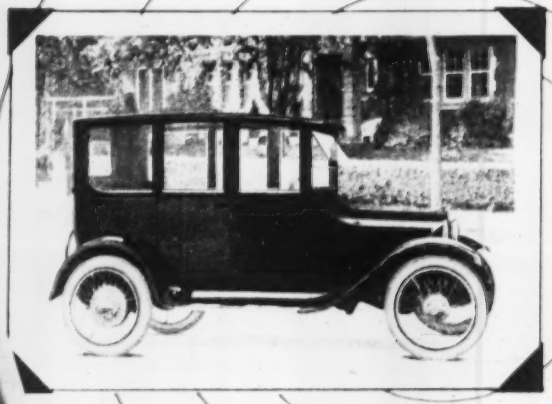
When measuring the value of a thread grinder remember the extra benefits of J & L top-flight construction. Write Dept. 710 for illustrated catalog.

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., 517 Clinton St., Dept. 710, Springfield, Vt., U.S.A. THREAD GRINDER DIVISION

another case where welded steel tubing does the job best . . .



HOW we took the rumble out of grandpa's sedan . . .

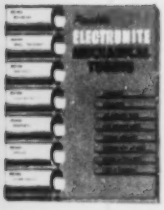
● Remember the rumble and roar that began when the old-style drive shaft under the floor started vibrating and whipping at 40 MPH.?

Today's automobiles can travel at twice Grandpa's speed with never a whisper of whip and rumble from the propeller shaft. Many such shafts are Republic ELECTRUNITE Tubing...uniformly round, fully concentric, with uniform wall thickness all around the tube and from end-to-end. There can be no heavy spots or light spots to throw the rotating tube out of balance.

Another advantage . . . Republic ELECTRUNITE Tubing has plenty of strength to withstand the reversal of torque when you release the accelerator and change from engine-driving to engine-braking conditions. The uniform walls of the light-and-strong hollow steel tube can "take" this twist for hundreds of thousands of miles.

This propeller shaft should give you the idea that welded steel tubing made the Republic ELECTRUNITE Way can take a lot of punishment . . . and come back for more. We'd like to tell you *all* the things that Republic ELECTRUNITE Tubing is doing successfully, and at lower cost. Write to:

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
253 East 131st Street • Cleveland 8, Ohio

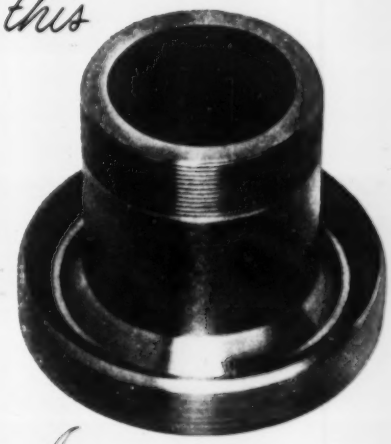


Write for this booklet of design data and ideas on Republic ELECTRUNITE *Mechanical Tubing. Ask for "Booklet STMT 100."*

Republic
REPUBLIC STEEL
ELECTRUNITE TUBING

automatic performance reduces costs

even on **SHORT RUN** *jobs like this*



A MOTOR MANUFACTURER who made this commutator sleeve, and similar components, in lots of 300 to 800 and in several sizes, said *"on a modern type, hand-operated turret lathe our net output varied from 2½ to 3 pieces per hour, depending upon conditions".*

Present output on his new Acme-Gridley Model M Single Spindle Automatic has more than doubled, as the job facts reveal. Much of this increase is due to Model M design features which avoid those so-called "conditions". Most important among these features is. . .

—fully automatic performance which guarantees a controlled cycle time and uniform precision—piece after piece

In other shops, these newest Acme-Gridley Single Spindle Bar Automatics, on hundreds of small and large lot jobs, are *2 to 10 times faster than the machines they replaced.* Ask for Catalog M-50A—better still, ask us to quote.

Other Model M time and cost reducing advantages are—

- Eight independently operated tool slides and three automatic spindle speed ranges selective to suit each cut, whether for use of carbide or high speed tools.
- Turret indexes in 1 second and its independent tool slides provide for overlapping operations such as several short end cuts while the heavy cuts are continued from the side slides.
- The Model M also features standard cams, interchangeable spindle speed and feed change gears, and wide open tooling zone—all quickly accessible. So the set up time for changing jobs to secure fully automatic performance on similar work does not exceed that of the hand operated lathe.

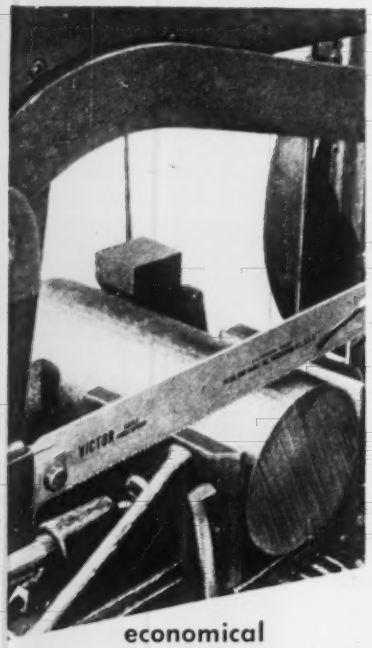
JOB FACTS:

Part: Commutator Sleeve
Size: 3⅛" dia. 2⅜" long
Material: C-1030 Steel
Machine Time: on Acme-Gridley 3½" Model M Single Spindle Automatic—10½ minutes.
Operations: 11, including rough and finish trepan on O.D. of flange for smooth finish, reaming hole for close concentricity and threading with automatic Vers-a-tool to class 3 fit.
Former Time: on current model hand operated turret lathe—20 to 25 minutes.

The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle—Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.



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Quality makes VICTOR Blades industry's preference—top-quality, carefully heat-treated steel, fabricated on specially designed equipment, to give you fast, economical cutting and long blade life. Send for the free VICTOR Metal Cutting Booklet which tells you how to pick 'em—Gold "Moly"® High Speed or Silver Unbreakable High Speed.

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from your
VICTOR DISTRIBUTOR

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Makers of Hand and Power Hack Saw Blades, Frames and Metal Cutting Band Saw Blades

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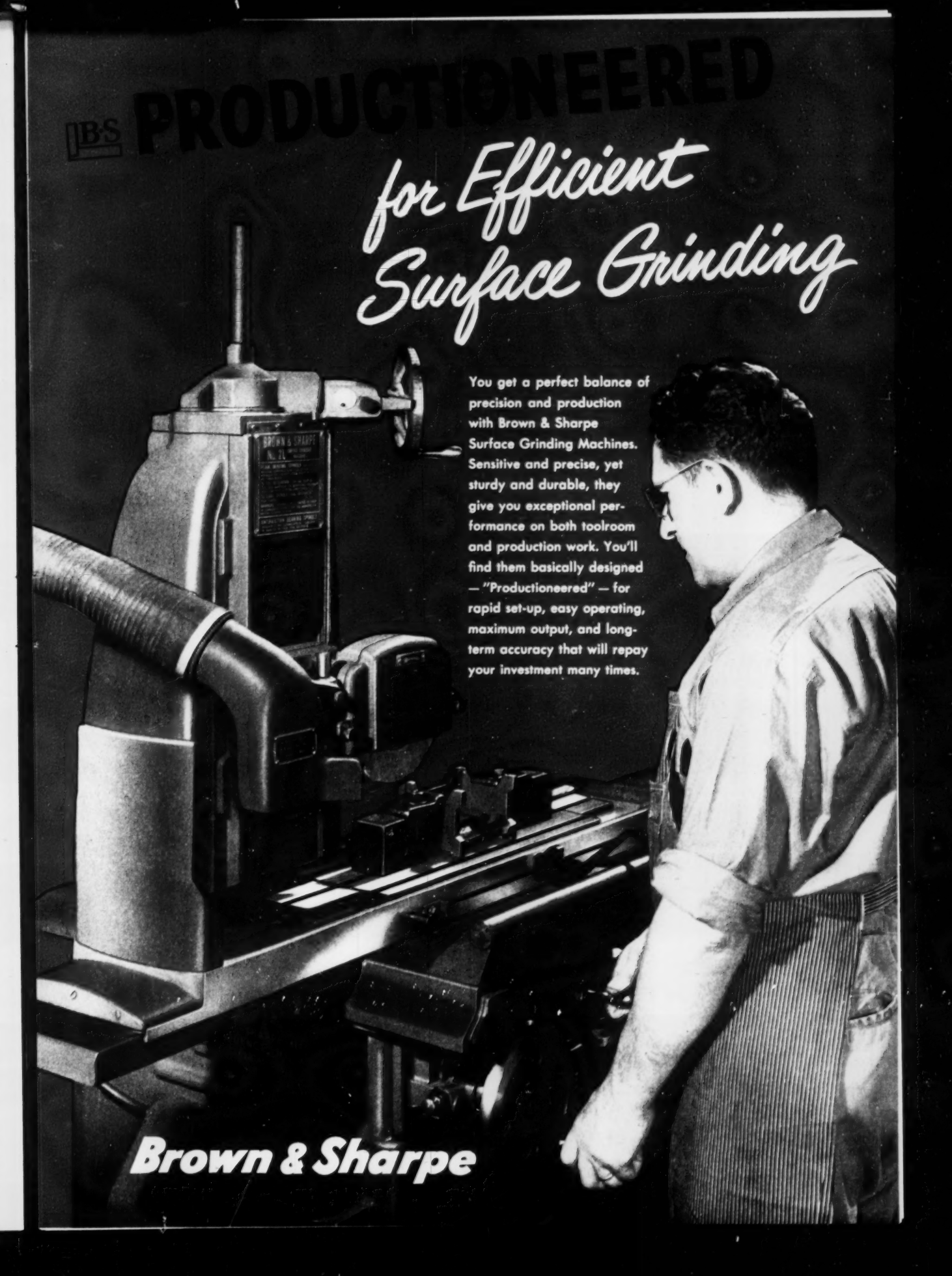
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You get a perfect balance of precision and production with Brown & Sharpe Surface Grinding Machines. Sensitive and precise, yet sturdy and durable, they give you exceptional performance on both toolroom and production work. You'll find them basically designed — "Productioneered" — for rapid set-up, easy operating, maximum output, and long-term accuracy that will repay your investment many times.
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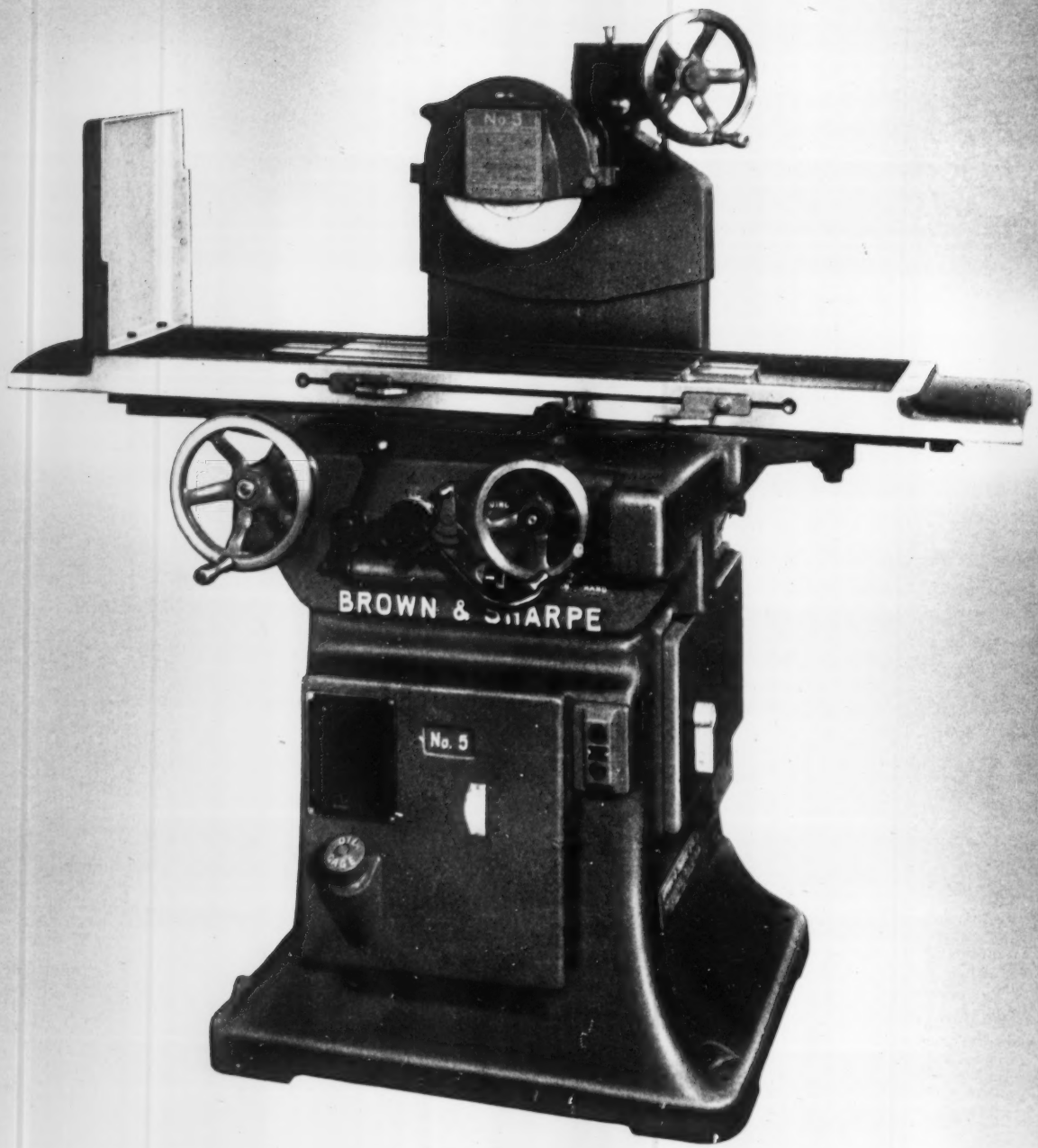

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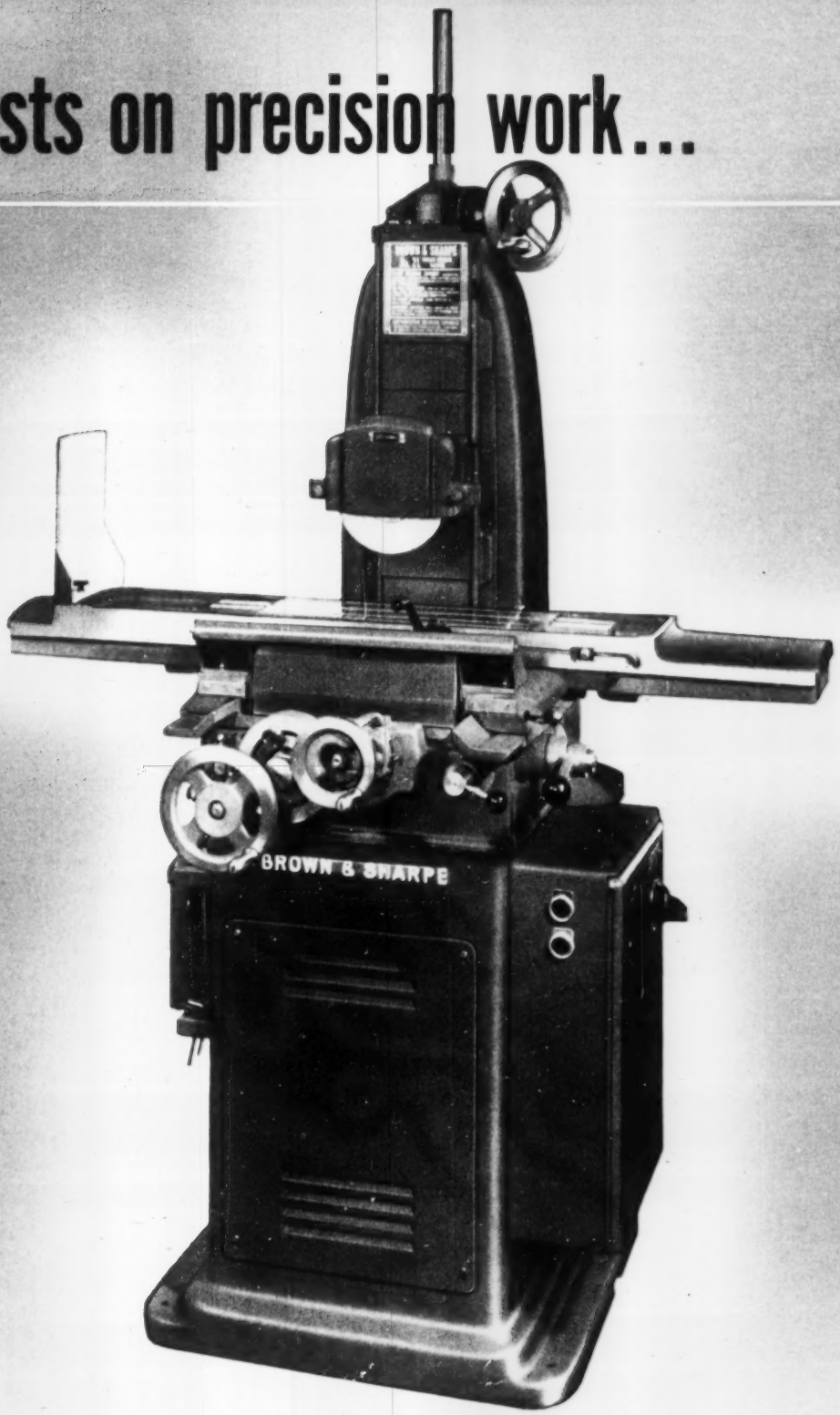
Where precision, fine finish, and rapid stock removal on flat surfaces are equally important, this productive hydraulic-type machine quickly pays for itself. Automatic hydraulic table feeds are powerful, smooth, quiet and infinitely variable. Centrally-located controls permit rapid set-up and easy operation. Flange-mounted removable unit-type wheel spindle provides accuracy of alignment — choice of plain-bearing or antifriction-bearing types. You'll find many other features for speed, safety, accuracy and long life that make the No. 5 ideal on both toolroom and production grinding for work up to 24" long, 8" wide and 11" high.

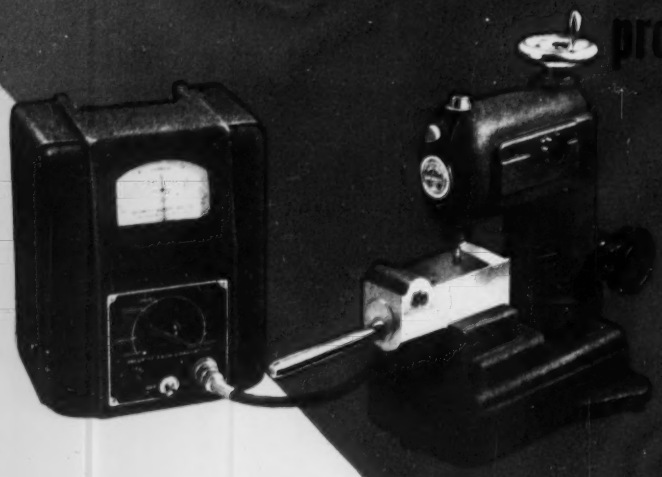
costs on precision work...



Brown & Sharpe Nos. 2L and 2LB SURFACE GRINDING MACHINES

These machines, long famous for their economical production of small to medium-sized precision work, give you the advantages of automatic lubrication and ample guarding to reduce maintenance costs and extend machine life. Removable unit-type precision wheel spindle, plain-bearing or antifriction-bearing — and rigid column construction—provide exceptional grinding finish with quick spark-out. The No. 2LB Machine with Hand Feeds Only is ideal for toolroom and production work where automatic feeds are not used. No. 2L (illustrated) and No. 2LB grind work to 18" long, 6" wide and 9½" high, using a wheel 7" in diameter.

"Productioneered" to aid in uniformly accurate production from your machines



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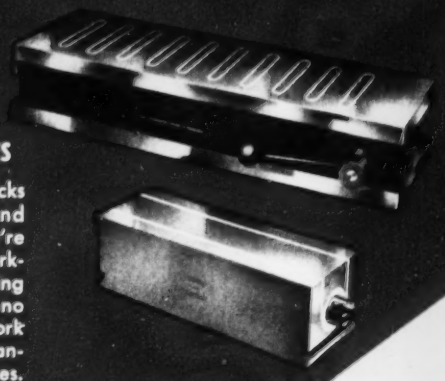
ELECTRONIC MEASURING EQUIPMENT

Precision gaging and inspection as close as .00001" are simple and fast with this equipment that practically eliminates human error — for external or internal measuring.



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These Permanent Magnet Chucks eliminate clamps, vises, and fixtures on many jobs . . . they're the time-saving way to solve work-holding problems. No operating costs, no electrical connections, no heating. Just turn lever and work is held firmly. Rotary and rectangular models. Wide range of sizes.

For sale only in the United States of America and its Territories.

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No. 616 CYLINDRICAL GRINDING AND INDEXING ATTACHMENT

This versatile attachment makes possible dry grinding of small cylindrical work on surface grinders. Accommodates tapers and work requiring indexing. Grinding is done on dead centers. Indexing, spring chuck, with spring collets, holds work hot ground between centers. Centers swing 6" diameter — take 5¼" length. Table tilts to 45°.

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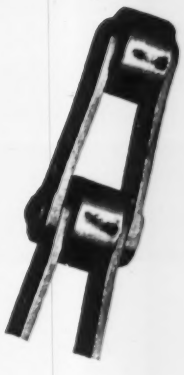
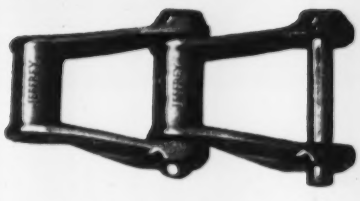
Jeffrey Chains and Sprockets are being put through the acid test of actual service on thousands of tough jobs . . . especially where the demand is for high-quality products. They are in universal use for unit machinery, for conveyors and bucket elevators, and for transmitting power. Follow the lead of those engineers who know the importance of "good chains and sprockets." Send for our new Catalog No. A-418 which goes into detail.

We show only a few types here but Jeffrey builds a complete line from which to choose.





THE JEFFREY MANUFACTURING CO.

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Columbus 16, Ohio

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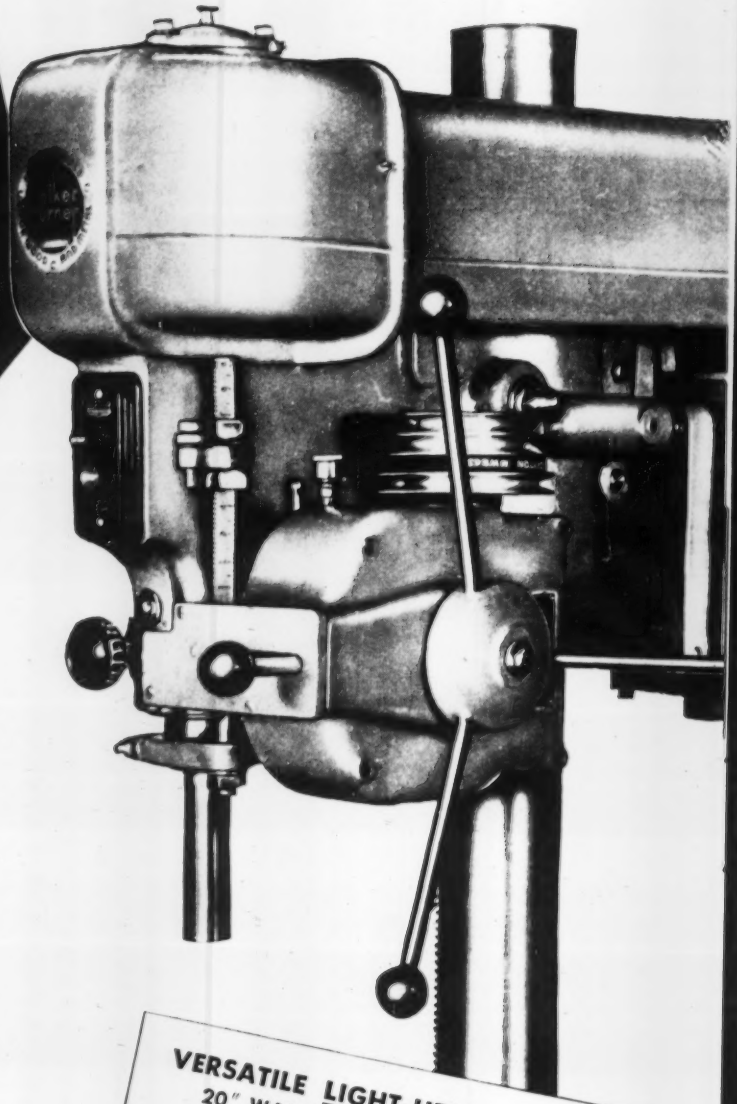
IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

It's no accident that

they're known as *LIGHT-HEAVYWEIGHT* Drill Presses



It was done by design— WALKER-TURNER Design

For jobs where neither the capacity nor expense of a heavy industrial machine is warranted, and where a "hobby drill" would be wholly inadequate, Walker-Turner has engineered a special class of Light-heavyweight Drill Presses.

Professional in design and operation, yet light for production machines, this "in-between" line gives industry the needed capacity for short-run production work, without the necessity of heavy investment. Walker-Turner makes 15" and 20" Drill Presses (in Bench, Floor, and Production Models), as well as Radial Drills. For complete information, use margin below to write your name and address.

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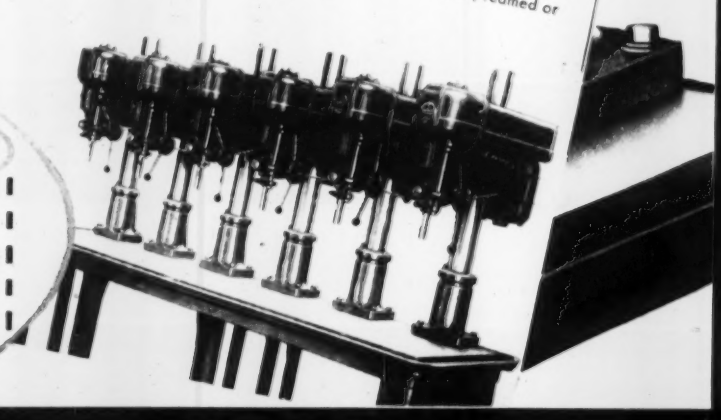
20" WALKER-TURNER DRILL PRESS
MULTIPLE-SPINDLE MODEL

Designed for industrial users where production rate and initial cost are primary factors in the selection of equipment, Walker-Turner 20" Drill Presses operate continuously and accurately at any rate of speed from 400 to 2600 r.p.m. Multiple spindle models (2 to any desired number) are particularly effective in increasing production on many jobs where a series of holes are to be drilled, tapped, reamed or counterbored in a single piece.



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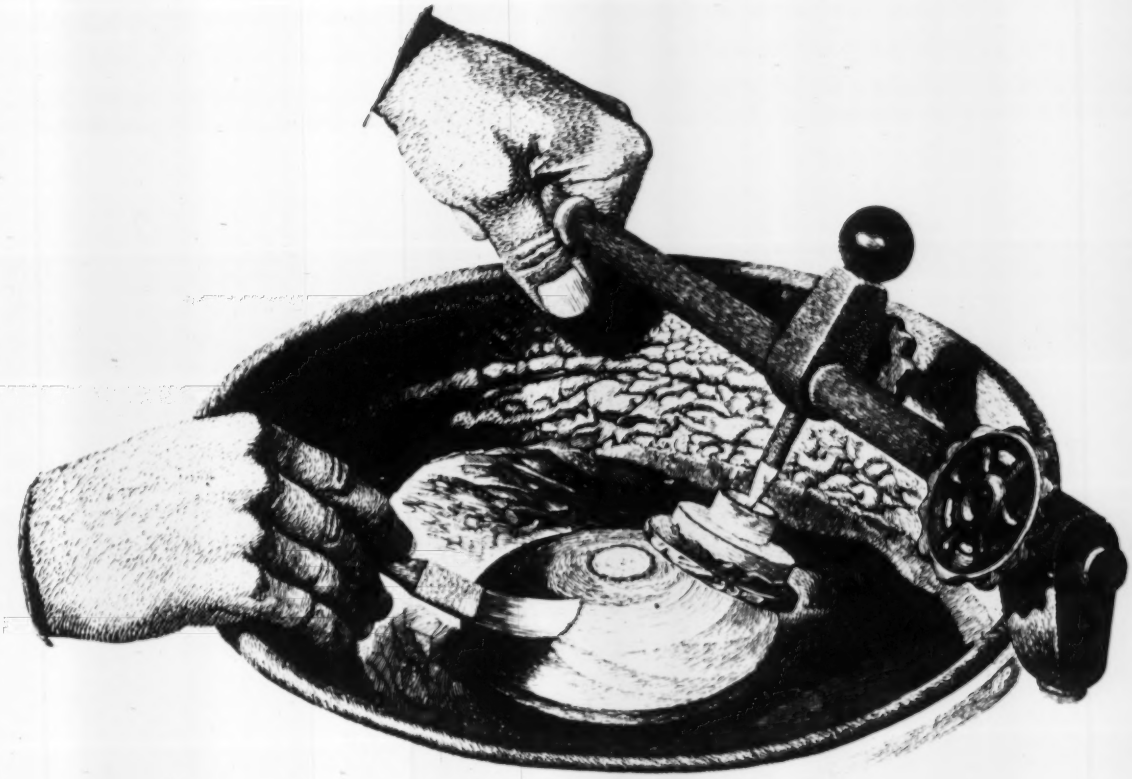
Dept. S-5, Plainfield, N. J.
(Please write your name and address in margin of page)



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Whatever your requirements for formability, uniformity, or drawing qualities, you'll find J&L Sheet & Strip . . . accurately and faithfully produced to meet your specifications. Complete understanding of the end-use of the sheet or strip you order is a rigid requirement of J&L production. You can depend upon J&L products to fit your production line.

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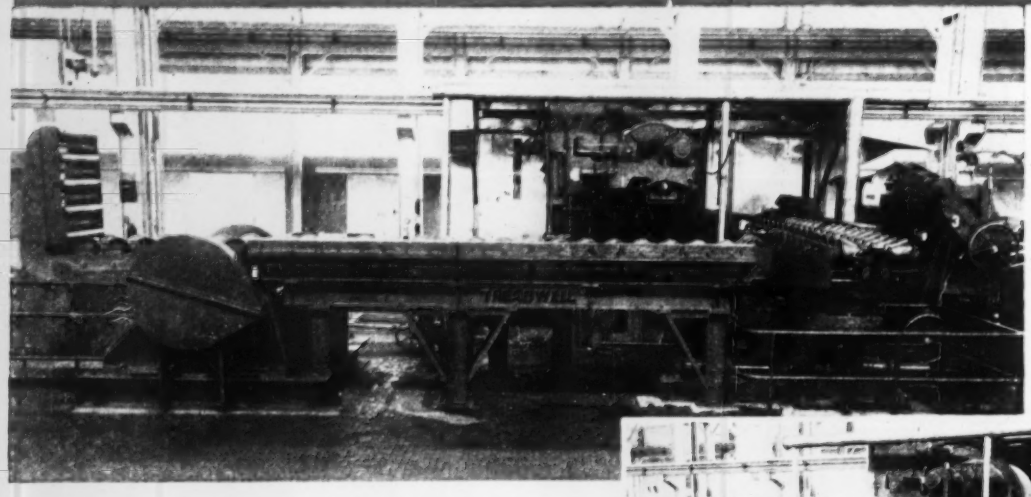
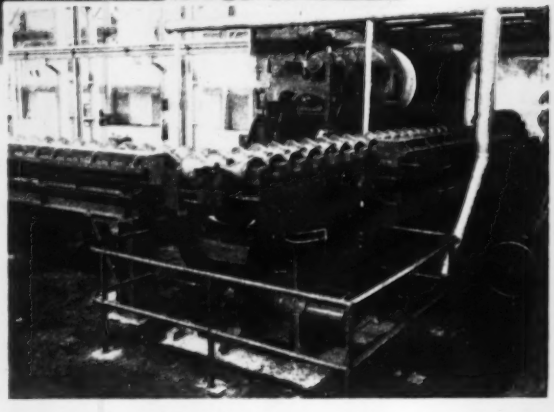
JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

Treadwell



Courtesy of Aluminum Co. of America



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The above Coiler and Coil Handling Equipment is being used on what is probably the largest Aluminum and Aluminum Alloy Strip Mill in operation. The Coiler automatically transfers the Coil to a Turn Table. The Coil is turned 90° and deposited on a Run-out Conveyor to a Downender. The Downender sets the coil on end, depositing it on a Storage Conveyor for distribution.

Our Engineers will be glad to discuss your Hot and Cold Strip and Coil problems with you. We manufacture all types of Rolling Mill Equipment including Blooming Mills, Bar Mills, Rod Mills, Plate Mills, and Strip Mill Machinery, as well as Slab, Billet, and Bar Reheating Furnace Equipment.

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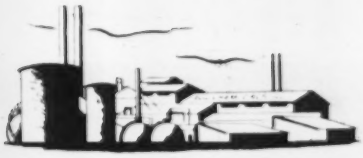
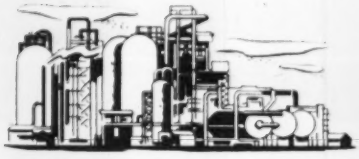
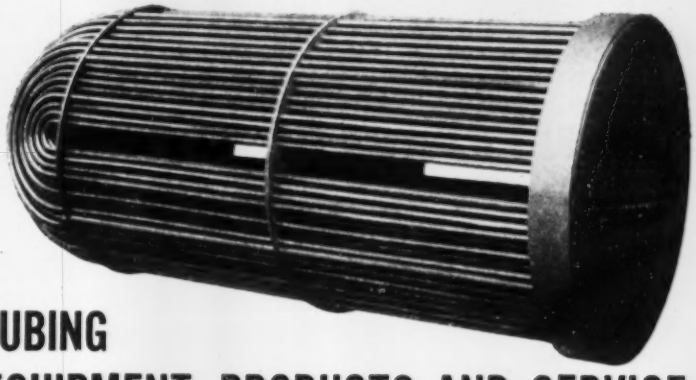


If Your Tubing Problems Involve Corrosion Resistance . . .





THEN HIGH QUALITY, WELDED STAINLESS TUBING WILL IMPROVE YOUR EQUIPMENT, PRODUCTS AND SERVICE

If you are fabricating or using tubing in corrosion resistance applications such as heat exchangers, condensers, evaporators, boilers, then you'll lower maintenance costs, improve your products and increase the service life of your equipment by using Pacific high quality, Welded Stainless Tubing.

PATCO Welded Stainless Tubing is made from bright-finished, high-quality, flat-rolled strip of uniform thickness and hardness. The finish is inspected on both sides. The strip is fusion welded under an inert gas shield (no flux or filler is used) to prevent porosity or contamination of the welded metal.

The tube is then subjected to severe cold work which removes the weld flash and produces clean smooth surfaces. Subsequent annealing to remove all traces of work hardening further refines the weld area. Soundness of the weld is doubly insured by special testing when welding and by the cold finishing operations that are employed.

There is no need for you to take chances with ordinary tubing when you can be sure of results with PATCO high quality, Welded Stainless Tubing. It's available now in sizes from $\frac{1}{4}$" to $2\frac{1}{8}$" O.D. in Types 304, 316, 321 and 347. For complete information write or mail the coupon today. If your need is urgent call UNderhill 0-4331.

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MT—1015, 1020, 1025
Round: $\frac{3}{16}$" O.D. to $2\frac{3}{4}$" O.D.
Square: $\frac{1}{4}$" to 2" O.D.

SEAMLESS ALLOY
4130—NE 8630
Round: $\frac{3}{16}$" O.D. to $3\frac{3}{4}$" O.D.
Square: $\frac{1}{4}$" to 2" O.D.

CHROME
4%-6%, 6%-8%, 8%-10%
$\frac{3}{16}$" to $1\frac{1}{8}$" O.D.

STAINLESS STEEL
Seamless and Welded
Types 304, 316, 321, 347
Round: $\frac{1}{4}$" to $2\frac{1}{8}$" O.D.
Square: $\frac{1}{4}$" to $1\frac{1}{4}$" O.D.

WELDED CARBON TUBING
$\frac{3}{4}$" to 3" O.D.

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COLD FINISHED
$\frac{3}{16}$" to $2\frac{1}{2}$"

For Other Shapes, Contact Mill

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☐ Please send me information on your welded stainless steel tubing.

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"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

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SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard, polished if specified — threads soft to close tolerance — points machine turned, flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish plain, zinc plated, cadmium plated. Size 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

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* SPECIALS furnished to BLUE PRINT SPECIFICATIONS

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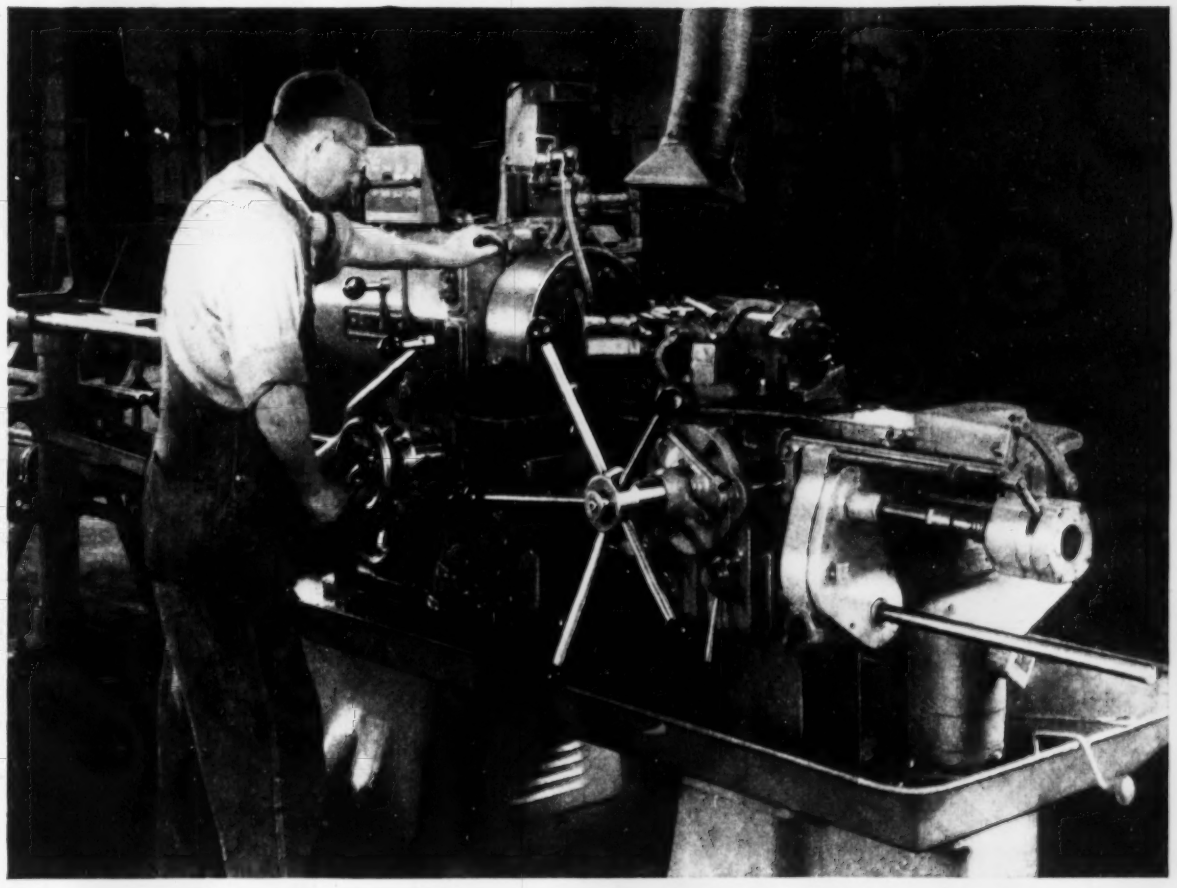
SEND FOR SAMPLES



MACHINING FOR GOLD at Homestake

with Gisholt Turret Lathes

Yes, gold mining means machinery. And here at the famous Homestake Mine at Lead, South Dakota, Gisholt Turret Lathes help to machine the machines that dig for gold. It's a big job, too—turning out the variety of rock bits and drill rods that are used up in large numbers.

This Gisholt Ram Type Lathe was first used to turn the plain ends on the one-inch quarter-octagon drill steel for two types of rock bits. Production averaged 30 an hour. Now, the machine is also used to machine and thread three sizes of forged steel drill rods. Besides all this, the Gisholt has the job of facing and chamfering the chuck, or shank ends, of the drill steel so that a perfectly flat face is hit by the drill machine tappet.

Here, again, Gisholt Ram Type Turret Lathes prove their easy change-over and ability to produce profitably, even on small runs—big assets in any machine shop. Ask your nearest Gisholt representative about them. Or write us.

GISHOLT MACHINE COMPANY

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Complete index of Reynolds literature and films on aluminum design and fabrication also available.

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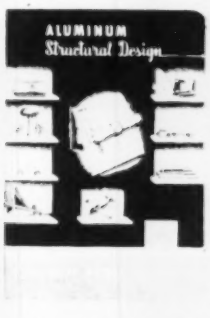
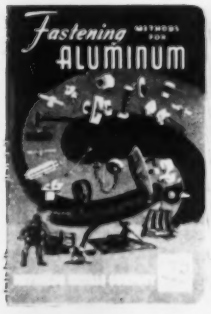
Instructors in technical schools are also invited to take advantage of these educational aids.

DESIGNING WITH ALUMINUM EXTRUSIONS—Explains the basic principles for using extruded aluminum shapes most effectively.



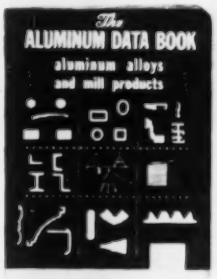
ALUMINUM STRUCTURAL DESIGN—Shows how to design original structures with aluminum or convert present designs to aluminum.



FASTENING METHODS FOR ALUMINUM—Offers information on mechanical joining and fastening methods, and the advantages of each.

FINISHES FOR ALUMINUM—Supplies basic information on the application and uses for electroplated, mechanical, chemical and organic finishes.

on Aluminum Design and Fabrication



ALUMINUM DATA BOOK—Discusses the physical, chemical and metallurgical factors of aluminum as they affect design and fabrication.

ALUMINUM POWDERS AND PASTES—Describes types of powders and their uses in coatings, pyrotechnics, processing, metallurgy, etc.

ALUMINUM FORMING—Describes accepted practices for bending, forming, and drawing aluminum.

MACHINING ALUMINUM ALLOYS—Discusses all phases of aluminum machining including automatic screw machining.

HEAT TREATING ALUMINUM ALLOYS—Explains the methods and results of heat treating suitable aluminum alloys.

WELDING ALUMINUM—Gives complete information on *all* types of welding as applied to aluminum.

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MODERN DESIGN HAS ALUMINUM IN MIND

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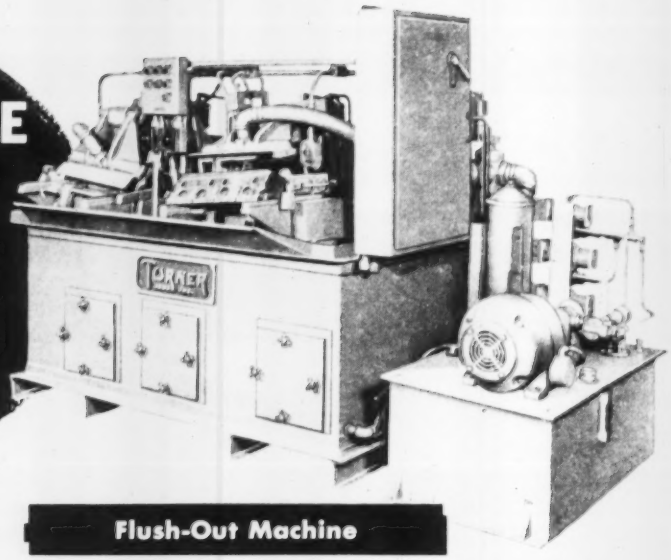
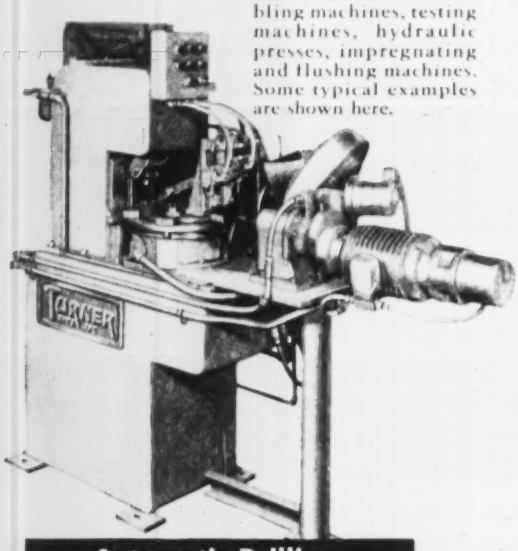
TURNER BROS. INC. DESIGNS AND BUILDS SPECIAL MACHINES TO HELP YOU *SAVE* ON MANPOWER, INSPECTION TIME AND FLOOR SPACE



Flush-Out Machine

Multiple cylinder head flush-out machine for testing and washing sand and chips from semi-machine cylinder heads. Cylinder head is placed in one side of machine, tripping limit switches, and when operator presses buttons, fixture closes, water pressure is automatically applied to fixture and forced into all openings that are not sealed in cylinder head. Water is flushed through all cavities in cylinder head for wash purposes. Pressure of water is equal to a ¾" stream forced 90 feet into the air. During the sequence of this operation, operator is unloading and loading other fixture on machine. Note two palm buttons for operator safety.

Turner Bros. are primarily known for designing and building special indexing, transfer and trunnion type drilling, reaming, tapping and milling machines. They also design and build other types of special purpose machines, such as assembling machines, testing machines, hydraulic presses, impregnating and flushing machines. Some typical examples are shown here.



Automatic Drilling, Assembling and Crimping Machine

Machine designed and built by Turner Bros. for the automatic hopper loading of breather nut, insertion of baffle, crimping of baffle, drilling of nut, and automatic ejection.

50-Ton Hydraulic Precision Assembly Press

Hydraulic Assembly Press for accurately maintaining center distances in assembling inner portions of fluid coupling. The ram on this machine is set with an indicator and the stroke is electrically and hydraulically controlled so that assembly of the three members is accurately maintained and production is increased.

Do you have a production assembly or inspection problem where you can utilize to advantage a special purpose machine? Why not write us today describing your problem. After our engineering department analyzes it, our field engineer will discuss it with you.

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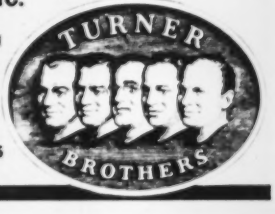
FERNDALE 20, MICHIGAN

DESIGNERS and BUILDERS of:

- **SPECIAL MACHINES**
- **JIGS and FIXTURES**



tool steel is the cornerstone of our business

Just as the cornerstone is of fundamental importance to a building, tool steel is the base of our business. And ever since we were founded — now over 50 years ago — we have been proud of our reputation as the nation's leading producer of tool steels.

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You too, can benefit from our long experience in this field through our freely available metallurgical service . . . and from our reliable delivery service through our fully stocked warehouses, conveniently located all over the country.

SEND TODAY for the unique Crucible Tool Steel Selector — a twist of the dial gives the tool steel for your application.

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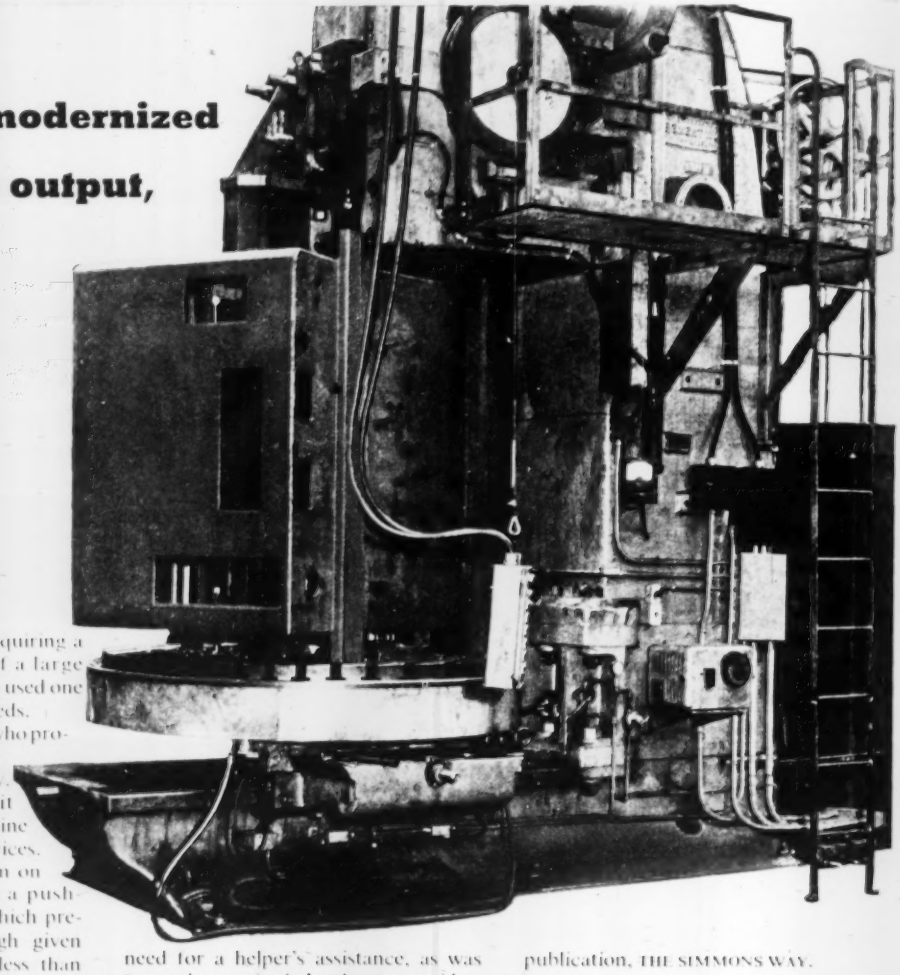
Engineered Rebuilding

How Simmons Methods Increase Machine Tool Output and Efficiency

Rebuilt and modernized slotter boosts output, saves time and labor...



Faced with the problem of acquiring a 72" slotter, the engineers of a large manufacturer decided to buy a used one and have it rebuilt to their needs.

But they wanted Simmons, who provided the slotter, to do more than restore it to peak efficiency. They wanted to *modernize* it ...to incorporate into the machine new labor and time-saving devices.

Simmons worked with them on the problem, came up with a push-button method of indexing which precisely turns the table through given angles of rotation. Error is less than 0.003" on the circumference.

Further modifications made are: increased vertical capacity; power table locks on anti-friction bearings in the table; automatic electromagnetic clutching of the various table drives; automatic lubrication; complete electrical control of all operations from a single pendant station.

The work went ahead on schedule and the machine is now in use. And, according to one of their firm's chief engineers, the modifications have eliminated manual layout work, and the need for a helper's assistance, as was formerly required. In short: considerable savings.

Will rebuilding work for you? It's easy to find out: simply send a list of your machines that might be rebuilt for extra capacity, renewed accuracy. We'll quote prices and delivery. Meanwhile, write today for a copy of our quarterly publication, THE SIMMONS WAY.

Simmons Machine Tool Corporation

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At Weirton, key men who may be needed for decisions on prices, quantities, metallurgy, deliveries, or other problems are within quick reach of one another. Sales, laboratory, production, shipping—all departments are "under one roof" to cut delays to a minimum when customers need quick action.

This method of operation was established for your benefit. When you are faced with a steel problem, pick up your phone and get *all* the answers quickly . . . from Weirton.

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TOPS IN CORROSION-RESISTANCE

PROVEN in hundreds of the toughest possible applications during the past fourteen years, flexible Tygon plastic linings offer more value today than ever before.

Greater toughness — more stability — even longer life. These improved performance characteristics stem from improved manufacturing techniques, resulting in a denser, more homogeneous body. Top quality yesterday, Tygon is an even better material today.

And along with improved quality — application methods have been simplified. Application is no longer a "factory" must. Strategically located Tygon licensed applicators can now install Tygon linings quickly and economically. Coupled with lower applied costs are important savings in freight costs — and vitally important savings in time.

For that next "tough" tank lining problem — ask for, insist on — Tygon.

This new booklet tells the "down-to-earth" facts about Tygon. Where and how to use it. When not to use it. A valuable reference for every engineer faced with corrosion problems. Free on request. Write for your copy today!

Address: Plastics & Synthetics Division, The U. S. Stoneware Co., Akron 9, Ohio.

U. S. STONEWARE

AKRON, OHIO

it doesn't look like a turret lathe, BUT...

- It sets up *fast*—like a turret lathe.
- It uses turret lathe tools.
- It machines turret lathe lots, on an automatic basis, without the usual penalties of automatic operation.
- It will combine certain operations not possible in accepted turret lathe practice, thus reducing machining time.
- It will automatically change speeds and feeds under cut to assure more efficient performance of your cutting tools.
- It requires less skill to operate—and in many cases one man can handle two or more machines.

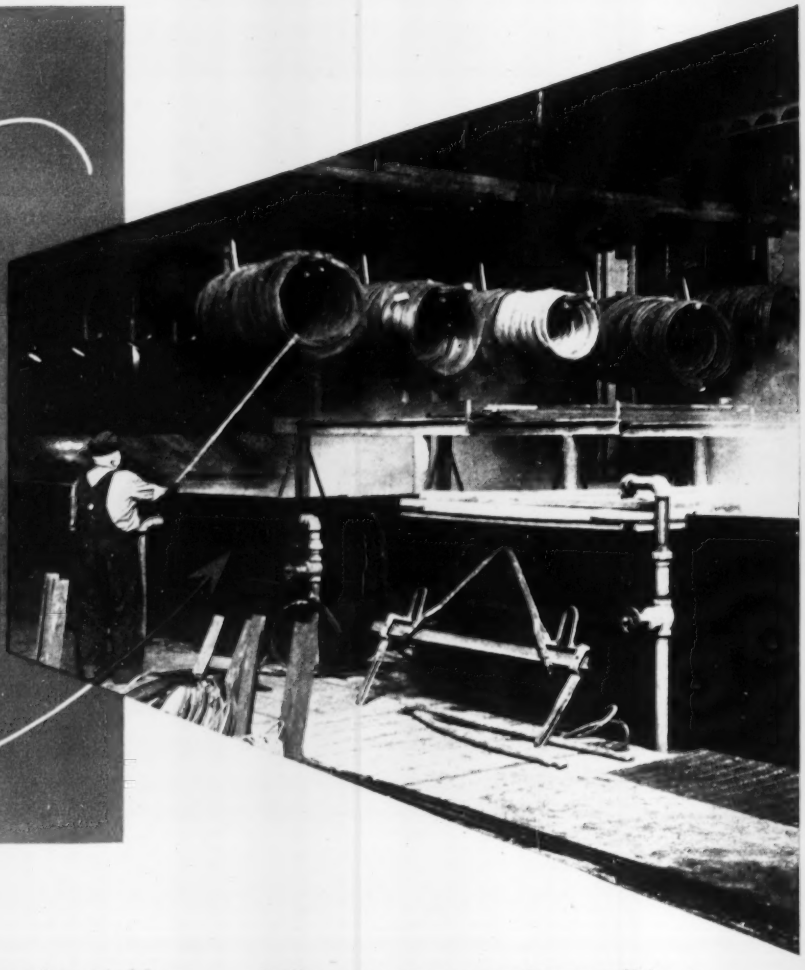
. . . it is the Warner & Swasey 1-AC Single Spindle Automatic Chucking Machine.

With today's emphasis on greater production, there are undoubtedly certain jobs in your shop that could be machined faster and better on the 1-AC. Call in your nearest Warner & Swasey Field Engineer—he'll show you exactly how it can improve your operation.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Do You Have a Corrosion Problem as Tough as This?



If you have a tough corrosion problem, there's a good chance you'll find the solution in durable Pitt Chem Tar Base Coatings.

Pickling tank surfaces like these, for example, *really* take a beating from constant exposures to acid spillage, fumes, and condensation. But month in and month out, Pitt Chem Tar Base Coatings can provide economical, long-lasting protection against these and similar extreme corrosive conditions.

Pitt Chem Tar Base Coatings are easy to apply and up to ten times as thick as ordinary paints. No other material does such a complete job of protection at so little cost.

Why not drop us a line, *right now*, outlining your problem? We'll gladly provide you with our recommendations . . . or supply the technical literature or assistance you need.

W&D 4485

PITT CHEM 101
For severest corrosive conditions

PITT CHEM 102
A thin, high gloss maintenance coating

PITT CHEM 103
For metal exposed to vapors, dilute acids and alkalis

PITT CHEM 104
For equipment handling potable water

AND OTHER SPECIALTY COATINGS

PROTECTIVE COATINGS DIVISION

PITTSBURGH COKE & CHEMICAL CO.

Grant Building - Pittsburgh 19, Pa.

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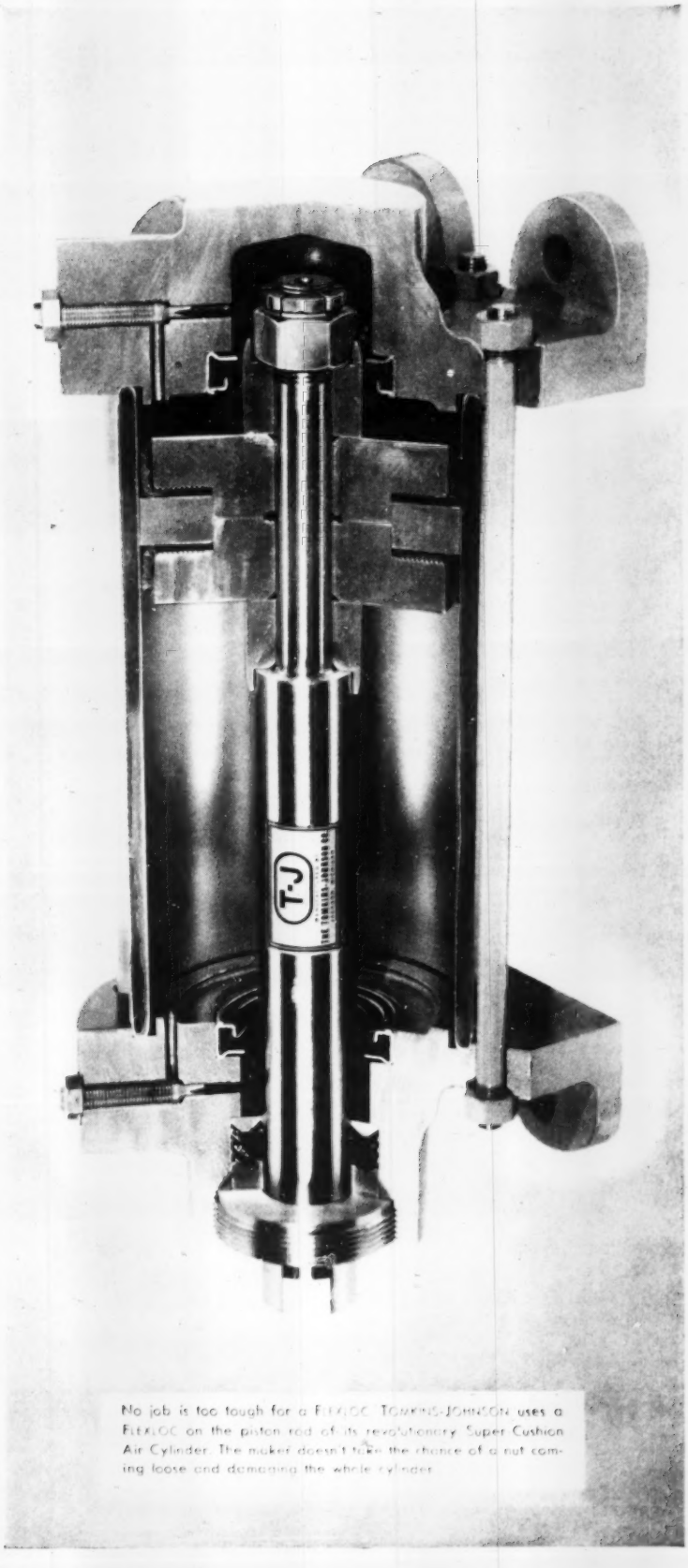
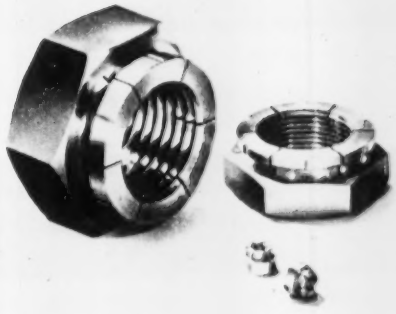


No job is too tough for a FLEXLOC. TOMKINS-JOHNSON uses a FLEXLOC on the piston rod of its revolutionary Super Cushion Air Cylinder. The maker doesn't take the chance of a nut coming loose and damaging the whole cylinder.



What FLEXLOC locknuts do for you

FLEXLOCS eliminate complicated, time-consuming methods of locking threaded fasteners. They offer simpler, faster application and safer, more dependable locking than plain nuts and lockwashers, castellated nuts and cotter pins, or nuts and jam nuts. And they won't work loose.

The reasons for all this are plain. FLEXLOCS are one piece—nothing to assemble, come apart, lose or forget. FLEXLOCS are all metal—have higher tensile than most other locknuts and are not affected by temperatures to 550°F. FLEXLOCS are both stop and locknuts—don't have to seat to lock, and stay put anywhere on a threaded member as soon as their locking threads are fully engaged.

SPS can deliver any quantity of FLEXLOCS in a wide range of sizes. Stocks are carried by industrial distributors everywhere. Write for literature. SPS, Jenkintown 33, Pa.

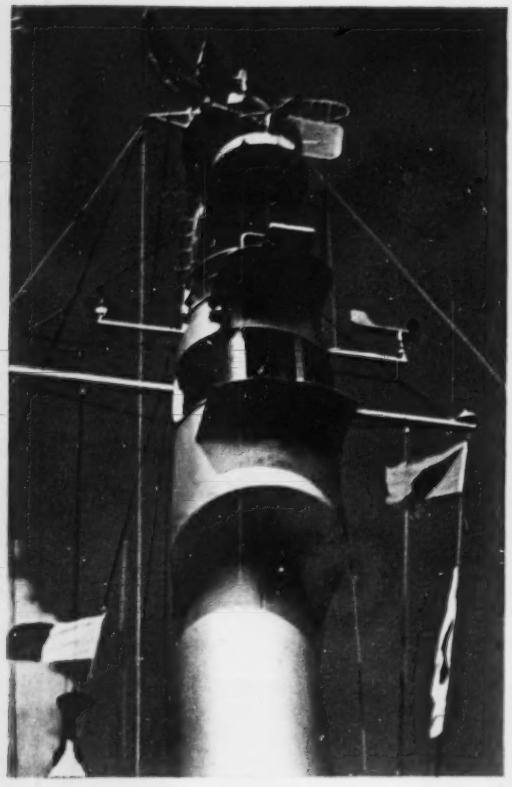
FLEXLOC

LOCKNUT DIVISION

SPS

JENKINTOWN PENNSYLVANIA

One Of Both Your A STAKE FOR THE FUTURE



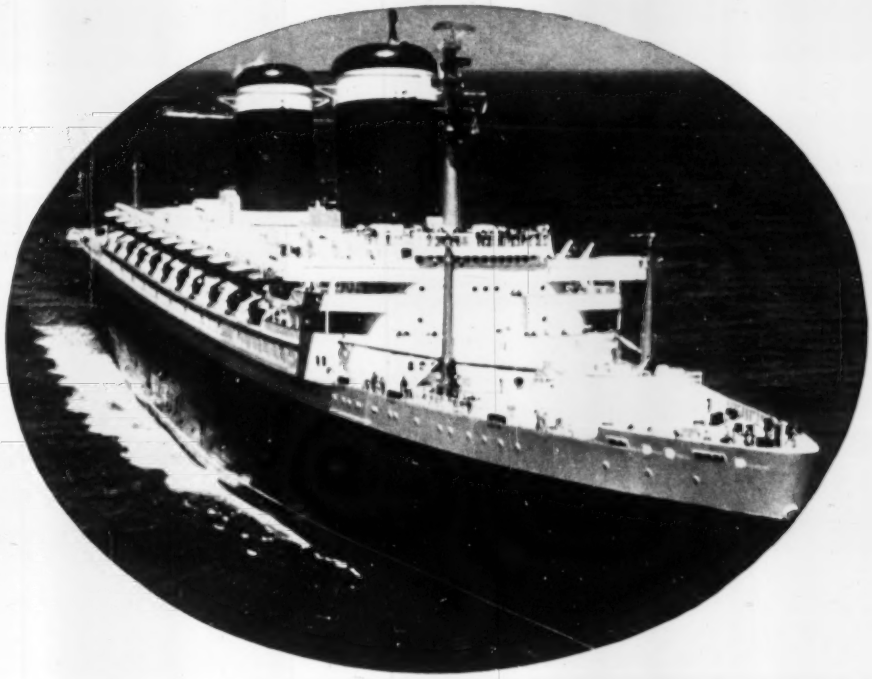
Dramatic radar tower of the S. S. United States. The ship was designed by Gibbs & Cox, Inc., built by Newport News Shipbuilding and Drydock Co., and is operated by U. S. Lines, Inc.

S. S. UNITED STATES MADE WITH BRICK!

Symbol of superiority among the world's merchant marine fleets. The fastest and safest passenger liner afloat. Flagship of American production . . . made with brick.

Refractory brick, that produced the thousands of tons of steel for the mighty S.S. United States. For her gigantic hull and the thousands of components . . . all made from steel, the metal that has established America as the industrial leader of the world.

In every type of furnace used in a steel mill, you will find refractory brick produced by GREFCO. The coke ovens that make the fuel for blast furnaces are built of silica and fireclay brick, while coke chutes and hoppers give trouble-free service when lined with CARBEX silicon carbide. A long-time standard of quality in coking chambers is GREFCO's silica brick. The same eminent position is occupied by GREFCO fireclay brick in other parts of the ovens. Both GREFCO silica and



fireclay brick are produced in strategic locations throughout the country.

In blast furnaces it's OLIVE HILL all the way. Hard fired, dense OLIVE HILL, a special high duty fireclay brick for which GREFCO is famous, provide the best of service in hearth, bosh and stack. Other GREFCO high duty fireclay brick are used in lining piping and other auxiliaries.

Most hot blast stoves are lined with dense, high duty fireclay brick but, for extra severe service, the combustion zone inner lining, the dome, and the top checkers, are built with HIAC or SUPERAC, super duty fireclay brick.

GREFCO's exclusive unburned REFLEX basic brick and STEELKLAD, a basic brick permanently jacketed in a patented steel shell, give unmatched service in the open hearth.

In every other phase of steel production, GREFCO products will be found. There would be no S.S. United States without steel . . . and there would be no steel without refractory brick. If, in your production, you demand quality refractories backed by the most modern of research facilities . . . available in whatever quantity you may require . . . call on GREFCO for a truly *complete refractories service*.

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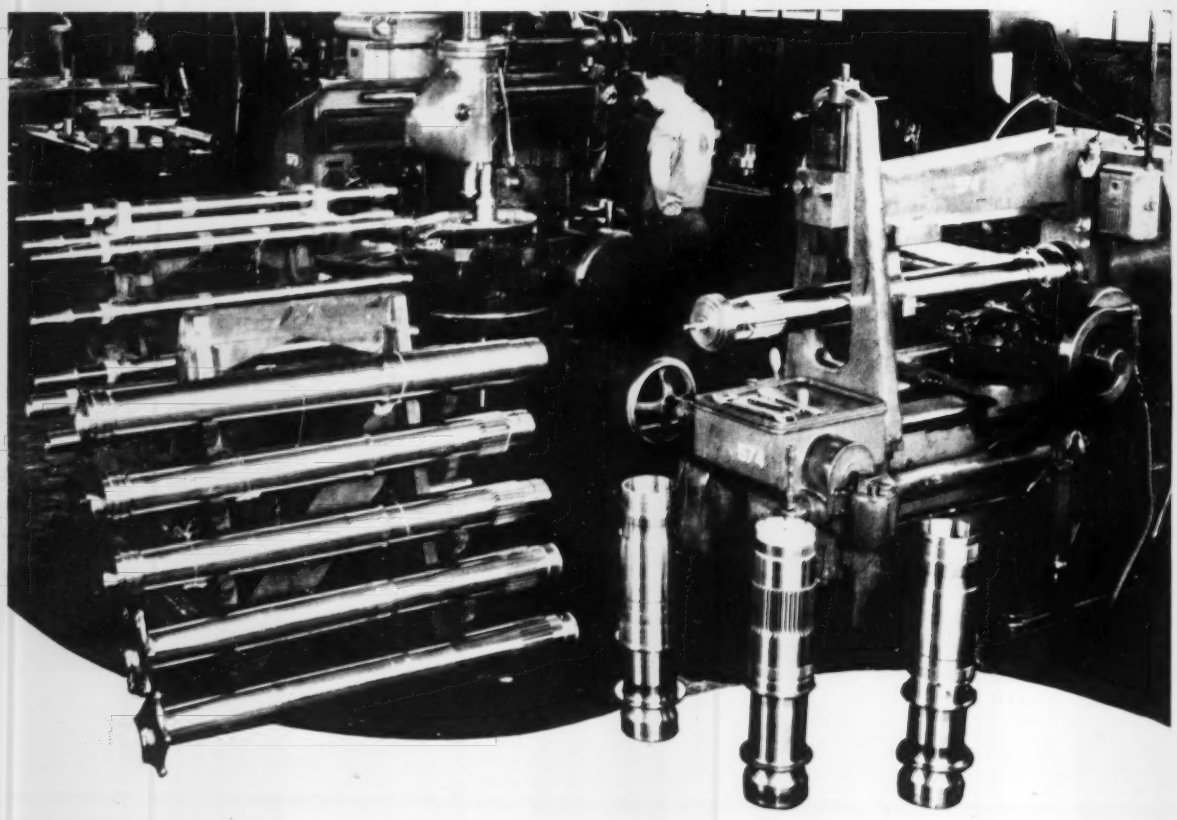

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FOR THE AIRCRAFT INDUSTRY

From its early days National Forge has produced alloy forgings, heat treated and machined to the exacting requirements of the Aircraft Industry.

We are proud that our facilities—the special electric steels, heat treating and skilled machining—have made it possible for us to assist the aircraft industry in pioneering the development of many mechanical components.

Pictured here are shafts for turbo jet engines and rotor shafts for helicopters, both requiring the maximum in strength and resistance to fatigue, wear and shock. Their production, here at National Forge, started with the steel itself, and through successive steps of heat treatment and machining were brought through our plant under the closest metallurgical and physical control.

National Forge has complete facilities and assumes the whole responsibility of producing your forgings from the steel through finish machining. This service is yours for aircraft or for commercial forgings.

NATIONAL FORGE AND ORDNANCE COMPANY

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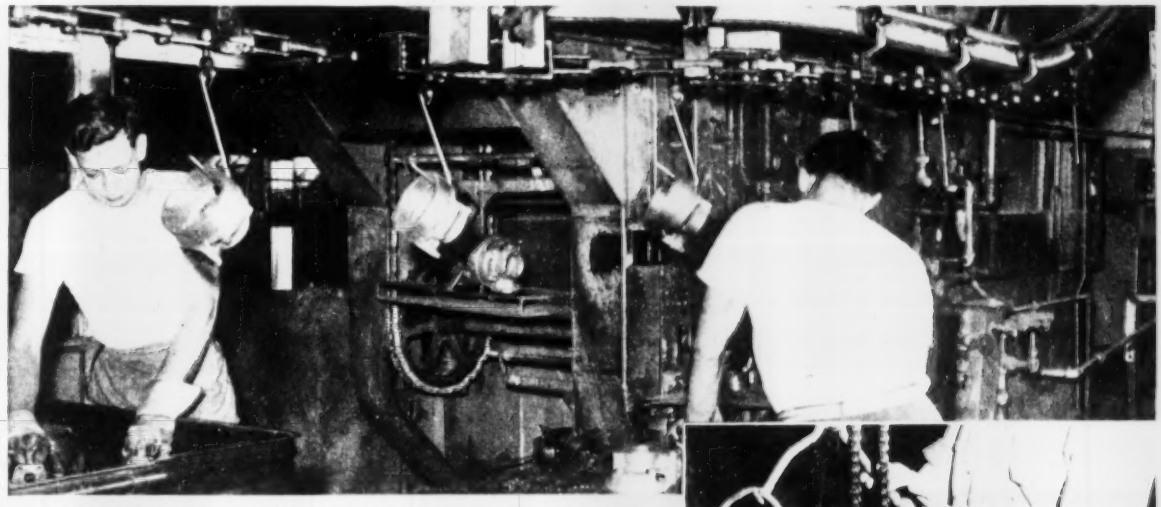
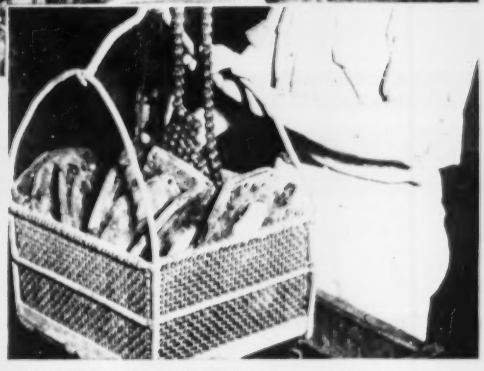
THE SOLVENT DESIGNED FOR MODERN VAPOR DEGREASING



CONVEYORIZED. "Triclene" D cleans refrigerator motor parts speedily and economically on a production line basis.



MANUALLY OPERATED. Castings will emerge clean, warm and dry from this small basket degreaser—instantly ready for assembly or further fabrication.

DU PONT "TRICLENE" D

(TRICHLORETHYLENE)

speeds conveyor and manual operations

You can't buy a better solvent for modern vapor degreasing than "Triclene" D. Whatever your present degreasing requirements are, rugged "Triclene" D assures you perfect solvent performance. That's because "Triclene" D has been carefully developed over the past twenty years—ever since Du Pont pioneered synthetic solvents for vapor degreasing—and is specifically designed to meet today's varied cleaning tasks.

Stable and pure "Triclene" D gives excellent results in high-speed degreasing operations—even those involving removal of the newer, chemically active lubricants. Its narrow boiling range permits easy solvent recovery from sludge for efficient re-use. And to help keep your *entire* metal cleaning operation at peak efficiency, Du Pont field men will gladly give you the benefit of their technical experience.

THIS VALUABLE INFORMATION IS YOURS—FREE

You'll find complete information on the operation and maintenance of vapor degreasing equipment in these booklets. And interesting, up-to-date case histories about degreasing units in operation throughout the metal field are presented in our publication "MODERN METAL FINISHING." You can receive this wealth of information by checking the appropriate boxes in the coupon below and returning it to us.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Del.

Please send me more information on vapor degreasing and "Triclene" D. I am interested in receiving the literature checked below.

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YOUR GUIDE . . . you *know* he'll take you where you want to go, by the quickest, easiest route. That's exactly what Bristol Brass aims to do . . . to get your order to you the same way. And that takes experience and *character* . . . both in the company and in its product.

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"Bristol-Fashion" means **Brass at its Best**

Only DRAVO *Counterflo* Space Heaters offer you these 5 exclusive features:

Ideal for heating large open spaces in industrial, commercial and educational buildings, standard Dravo *Counterflo* Space Heaters have five exclusive advantages over other warm-air space heaters.

1 The Dravo *Counterflo* combustion method takes place in a stainless steel combustion chamber. The exhaust gases from combustion are "whirl-cooled" through two sets of economizer tubes. This four-pass heat transfer results in a minimum heating efficiency of 80%.

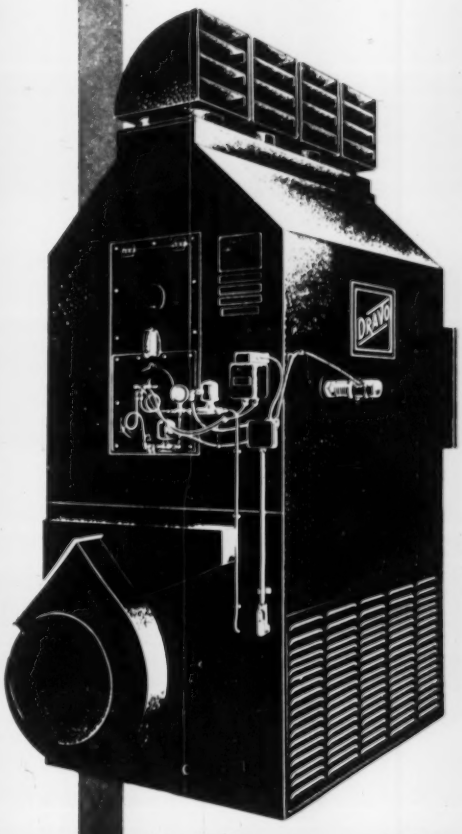
2 One rotor shaft operates all heater fans, thus co-ordinating exhaust, air-intake and heat-discharge systems.

3 Air for combustion is provided by main supply fan; volume and velocity are controlled by an adjustable damper.

4 Approved by American Gas Association and listed by Underwriters' Laboratories, Inc.; Dravo Safety Control Circuit is accepted by Factory Mutual Engineering Division.

5 Burners are designed by Dravo Engineers for top efficiency. Heaters burn gas or oil; burners are interchangeable to take advantage of fuel savings by using the most economical source of supply or in times of shortage the most available fuel.

Dravo *Counterflo* Space Heaters in addition to comfort heating are easily adapted to heat curing and process drying, tempering of replacement air and summertime ventilation. Dravo Heaters can also be tied in with air conditioning systems by making use of the same ductwork.



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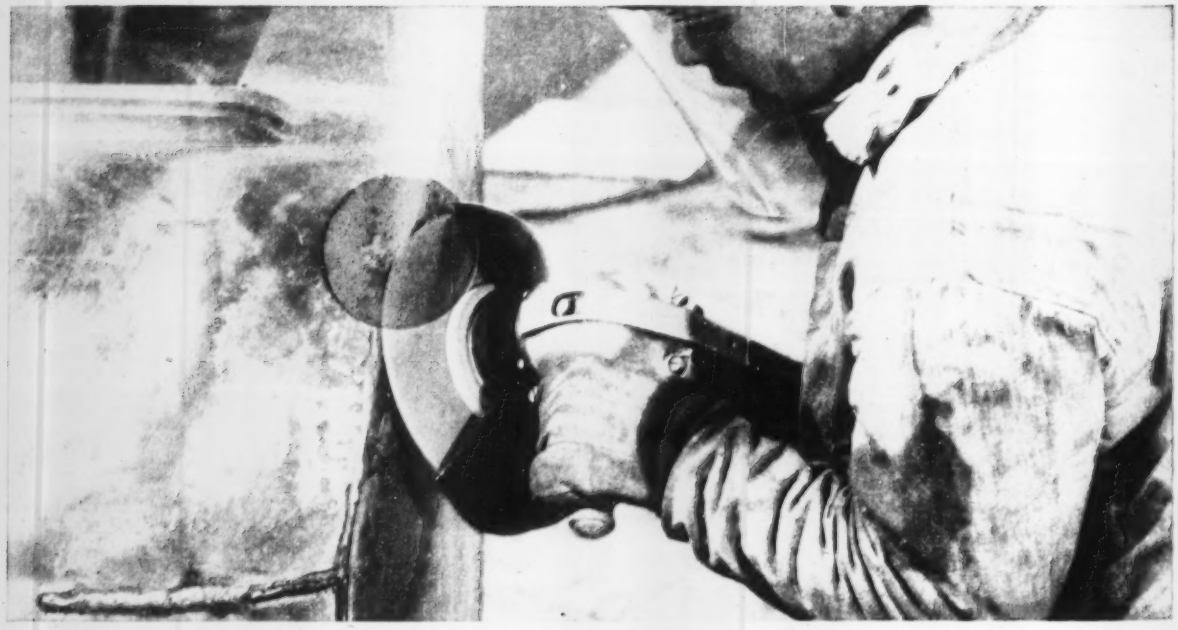
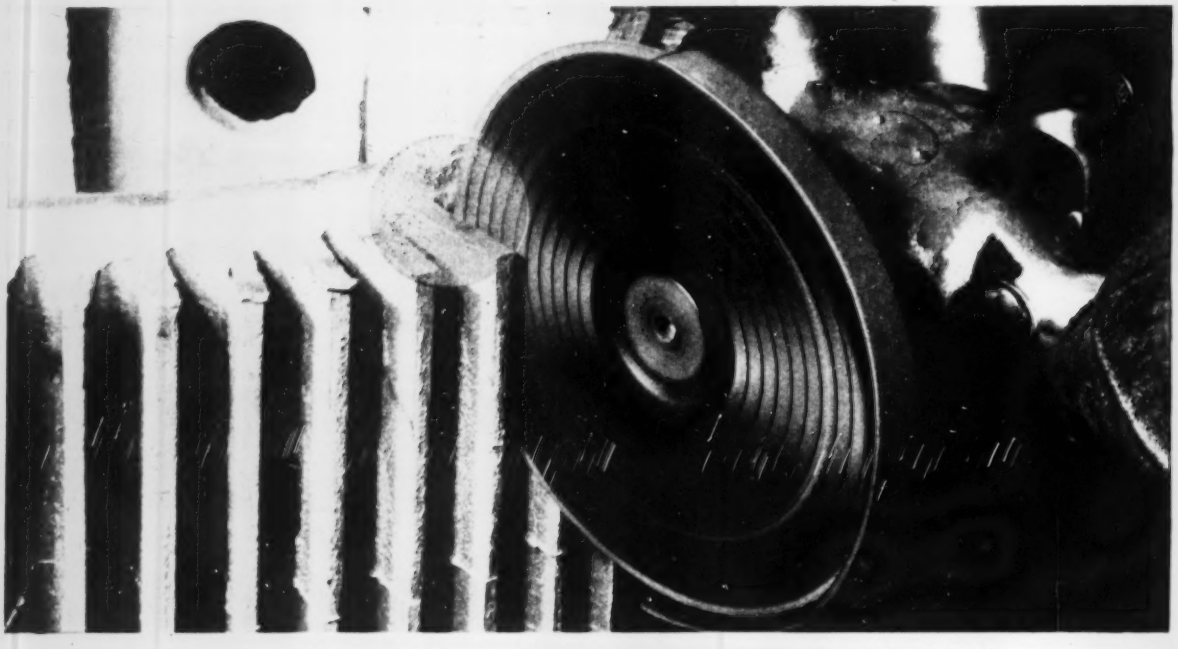


BLENDING IN A WELDED CORNER is a job you can do faster and better with a Norton BFR semi-flexible wheel.

Here's your "TOUCH OF GOLD" team for more economical portable grinding



CLEANING OUT FINS of a compressor casting is a hard job made easy — when you use a Norton BD rigid wheel.

There's gold in hub-wheel grinding — the real cost-cutting, value-adding "Touch of Gold" that you can bring to job after job with these faster, safer Norton Reinforced Hub Wheels!

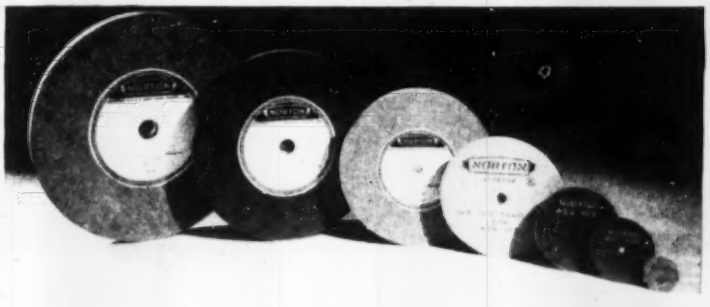
They're the long popular Norton BD rigid wheel and the newer Norton BFR semi-flexible wheel. Beyond any doubt they're the most useful pair ever built for portable grinding. They're lighter and easier to handle than cup wheels, longer lasting than coated abrasive discs, and more versatile than either.

Built-in speed and safety

Made of aluminum oxide and silicon carbide abrasives, resinoid bonded, both the BFR and BD wheels cut fast and cool, without spalling or loading. And for tops in safety, they're reinforced with nylon webbing. Even if breakage occurs this strong web keeps pieces from flying off in all directions, until the machine can be stopped.

Covering a wide job range

Where finish is most important — especially for blending corners and contours — you'll like the way the semi-flexible BFR wheel hugs the work. Where stock removal is the main factor, you'll prefer the heavier duty, rigid BD wheel. And with both these wheels working for you, you have a grinding team that will help you turn out better products faster and easier — adding the profit-boosting "Touch of Gold" to countless every-day jobs.



NEW! . . . The Norton BF Wheel For Light Finishing

Meet the latest Norton development for your lighter finishing jobs. Basically, the new BF wheel is built like the BFR wheel but is designed especially for periphery grinding. You'll find its flexibility in the softer grades (G and I) ideal for blending and smoothing curved surfaces and corners. The hardest grade (K) is more rigid — best for light welds and sharp edge applications. In all grades it tends to finish as it cuts.

Like the BFR and BD wheels, the new BF wheel cuts fast and free and has a high safety factor. Like them, too, it features versatility, covering a range of usefulness that includes finishing stainless steel welds, deburring metal parts such as stampings and removing gates and fins from molded plastics. Let the new BF wheel add "The Touch of Gold" to many of your own light-duty grinding jobs.

GET YOUR NORTON DISTRIBUTOR TO DEMONSTRATE

these versatile Norton wheels in your shop. He'll be glad to help you on any grinding problem and, if necessary, he'll call in a Norton Abrasive Engineer. Or write to NORTON COMPANY, Worcester 6, Mass. for descriptive folder #225. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

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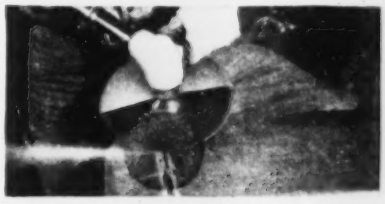
Making better products to make other products better

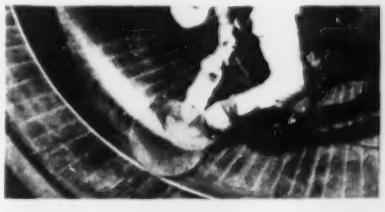
Put the value-adding "TOUCH OF GOLD" into jobs like these



Cutting down a heavy weld — rigid BD

Blending a welded radius — semi-flexible BFR

Smoothing a flame-cut edge — rigid BD

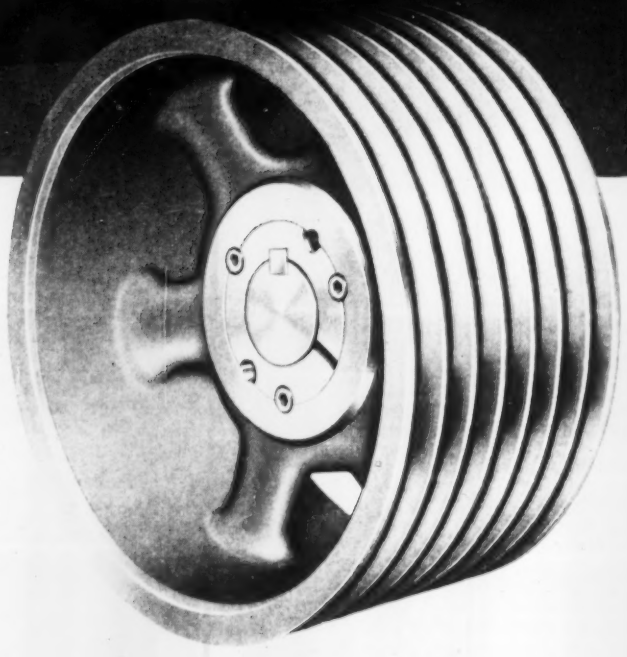


Grinding welds in a fabricated cone — semi-flexible BFR

Smoothing a weld seam — semi-flexible BFR

Notching risers on gray iron castings — either type

There's only ONE TAPER-LOCK



TAPER-LOCK sheaves run true! The patented Taper-Lock bushing grips the shaft for the full length of the bushing—holds with the firmness of a shrunk-on fit!

Every belt pulls its full share of the load. Grooves, machined on precision equipment, have identical pitch diameters, assuring equal belt tension.

Easy on—Easy off. Slip it on the shaft, line it up and tighten while sighting. In ease and speed of mounting and demounting you'll appreciate there is only ONE Taper-Lock.

No flange, no collar, no protruding parts. Flush hub means safety.

Taper-Lock sheaves are available from distributors' stocks in complete range of sizes in A, B, C and D grooves.

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CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone book.

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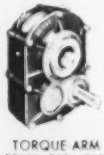

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ROLLING GRIP AND DIAMOND D FRICTION CLUTCHES

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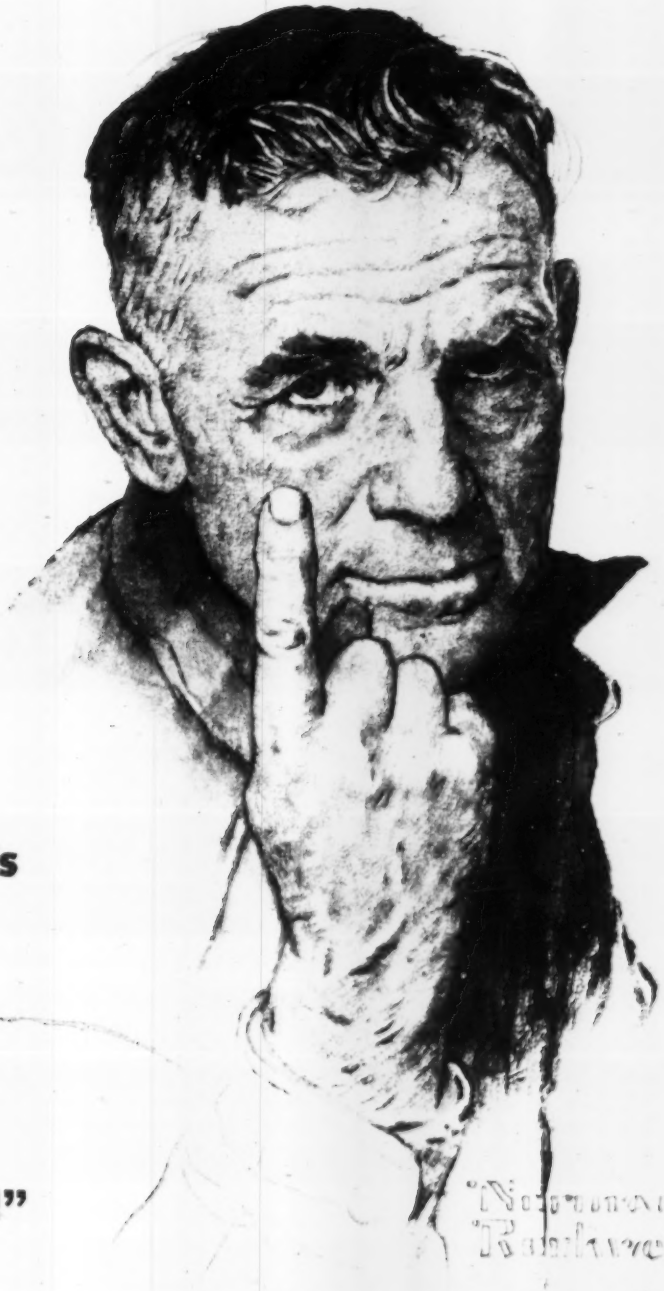
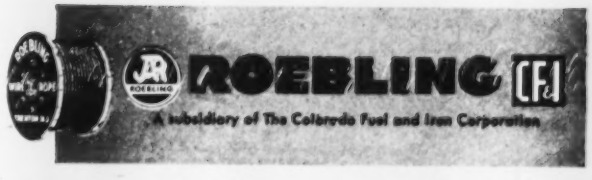


"There's only ONE reason!"

IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the industrial field prefer Roebling wire rope... *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your operations.



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when you specify light wall schedule 5 pipe

WHAT SCHEDULE 5 PIPE IS—

A light wall pipe, Carpenter Schedule 5 gives you more feet of pipe for every pound of scarce stainless steel. So you can quickly see how Schedule 5 reduces your cost per foot. Plus the fact that the larger I.D. means increased flow area.

HOW SCHEDULE 5 REDUCES COSTS

First saving is 40% to 50% on the cost of your pipe.

Since Schedule 5 is considerably lighter, this means quicker and easier installation.

And, because the increased capacity of Schedule 5 lets you use the next smaller pipe size, you can reduce substantially your costs of valves, fittings, etc.

FITTINGS ARE AVAILABLE

This pipe is easily adapted to use with existing lines of tubing or Schedule 40 and 10 pipe, using simple connectors. Fittings as well as stocks of Schedule 5 pipe are carried by conveniently located Carpenter distributors.

ADDITIONAL ADVANTAGES

Tubing sizes can now be replaced with light wall *pipe* . . . for ready hook-up with standard valves, pumps and other equipment which is normally manufactured in pipe sizes.

Data Sheets give you complete information about Carpenter Schedule 5 Stainless Pipe. Write for your personal copy. THE CARPENTER STEEL COMPANY, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

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STAINLESS TUBING & PIPE

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for time-saving, money-saving

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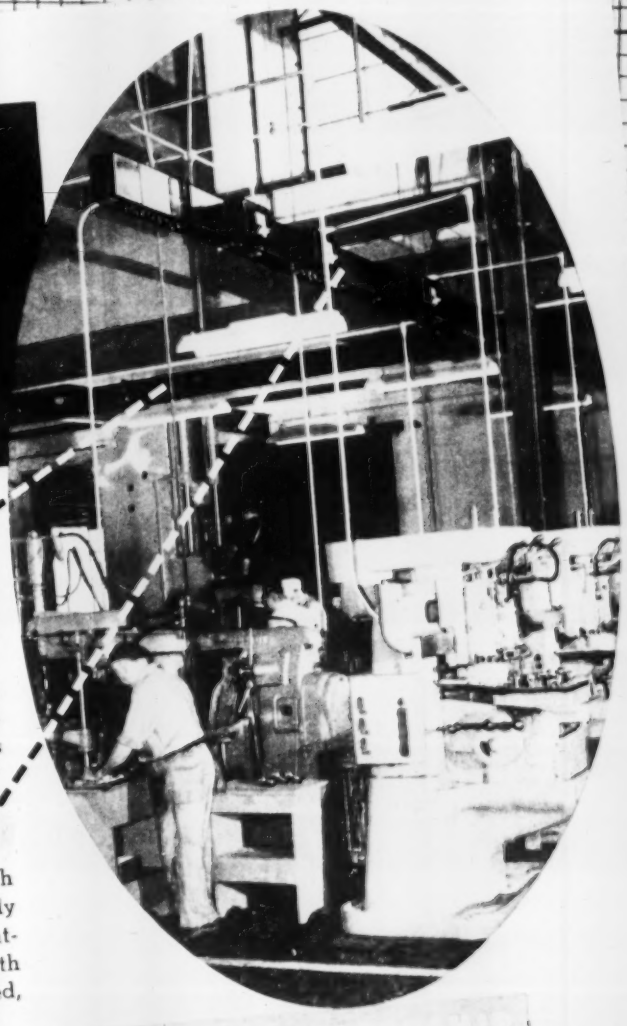


SQUARE D FEED-IN DUCT

is the most efficient way to transmit large amounts of power. It provides the lowest known voltage drop—only 1.8 volts per 1000 amperes per 100 feet.

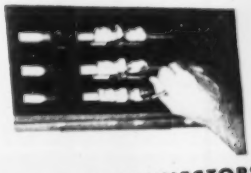
Exclusive design requires no ventilation—permits a totally enclosed, compact, dust-excluding enclosure. Rigid construction provides high resistance to heavy electrical stresses.

SQUARE D PLUG-IN DUCT

provides flexible power distribution for branch circuits. Machinery can be rearranged quickly at minimum cost. Plug-in units can be attached at frequent intervals along the length of the duct, providing power where it's needed, when it's needed.

NEW JOINT DESIGN. Feed-in Duct joint design saves installation time and reduces maintenance cost. Duct ends are identical—unnecessary to select mating ends before positioning or hanging duct sections. Outward-facing, pre-installed bolts permit rapid assembly and easy maintenance.

ROUND BUS BARS for Plug-in Duct provide greater mechanical strength and resistance to short-circuit stresses. Circuit breaker or fusible type plug-in units are easily installed at 2-foot intervals along both sides of the duct. Plug-in stabs grip the round bus bars with exceptionally high pressure.



FLEXIBLE CONNECTORS of laminated copper join bus bars between sections—permit proper alignment, insure tight joints and provide for expansion and contraction at Plug-in duct joints. All bolt heads face outward for greater accessibility.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

1903 · 50 YEARS OF DESIGN LEADERSHIP · 1953

SIZE IDENTIFIED ASSEMBLY SIMPLIFIED

The Only

SIZE-MARKED GEAR GRIP SOCKET HEAD CAP SCREW

The size is clearly incised on the head, can be seen at a glance. It prevents errors by "green" workers, helps veterans also to speed assembly. It saves time and wasted screws when sizes get mixed up.

It's a sales feature for your product. Your customers' maintenance men will like the Size-mark . . . it aids them in reassembling after servicing. Gear Grip prevents slips, speeds work, even when fingers are oily.

Since there is no better Socket Head Cap Screw made, why not get these important extra features offered only by P-K? Ask for samples. Parker-Kalon Corp., 200 Varick St., New York 14, N.Y.

FOR ANY TYPE SOCKET SCREW—
REMEMBER

IF IT'S **P-K** IT'S O.K.

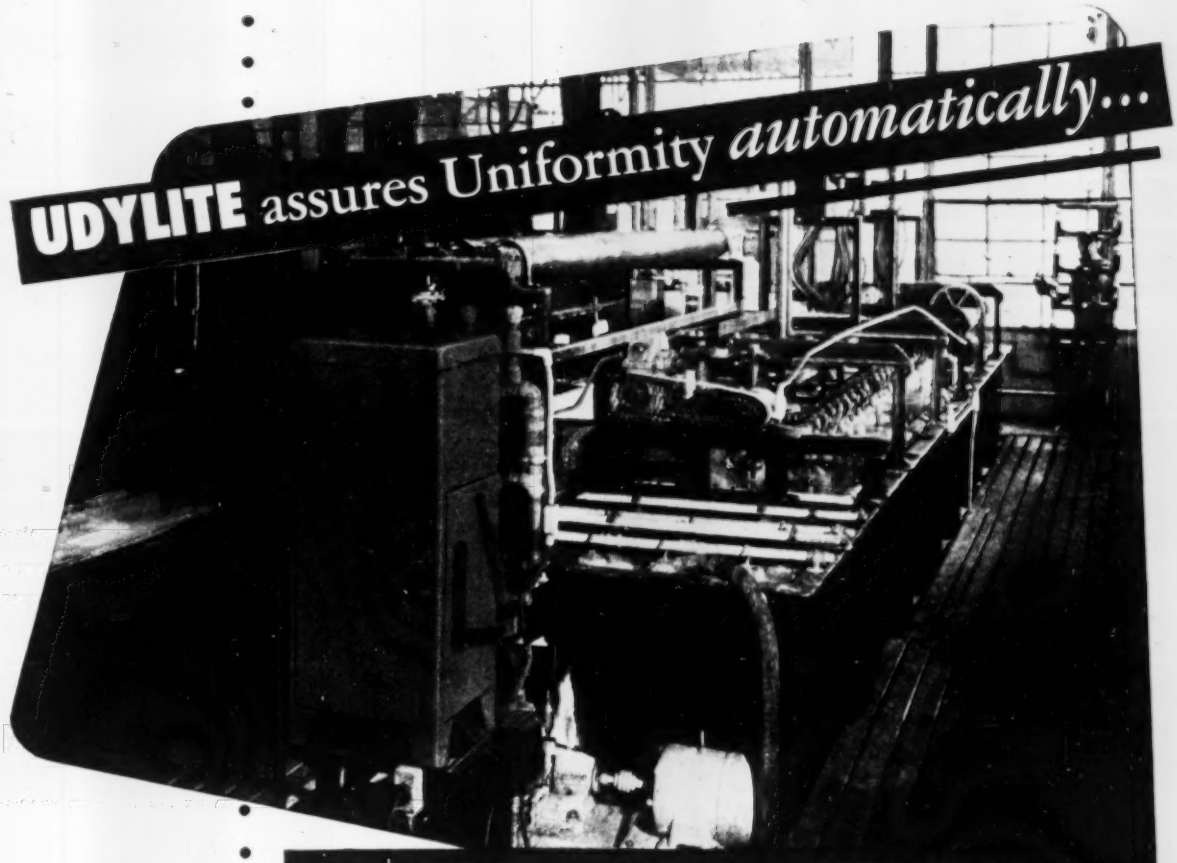
TRADE MARK REG. U.S. PAT. OFF.

PARKER-KALON®

Sold through Industrial Distributors, the Supply Specialists that serve you

Cold-forged **SOCKET SCREWS**

UDYLITE assures Uniformity *automatically*...



AT MICHIGAN CHROME & CHEMICAL CO.

"With Udylite equipment we get tough, durable metal finishes that are *always* uniform. That means fewer rejects—lower costs." That's the experience of Michigan Chrome & Chemical Co. with Udylite Equipment. They do a wide variety of plating . . . and they know Udylite equipment speeds production—allows them to shift quickly and economically from one job to another—as well as keeping rejects to a minimum. Udylite equipment and machines can do the same for you in your metal finishing operations. Call your Udylite technical man today. Let him show you Udylite methods of better plating. Learn how you can up production—cut costs—increase profits!

EQUIPMENT

SUPPLIES

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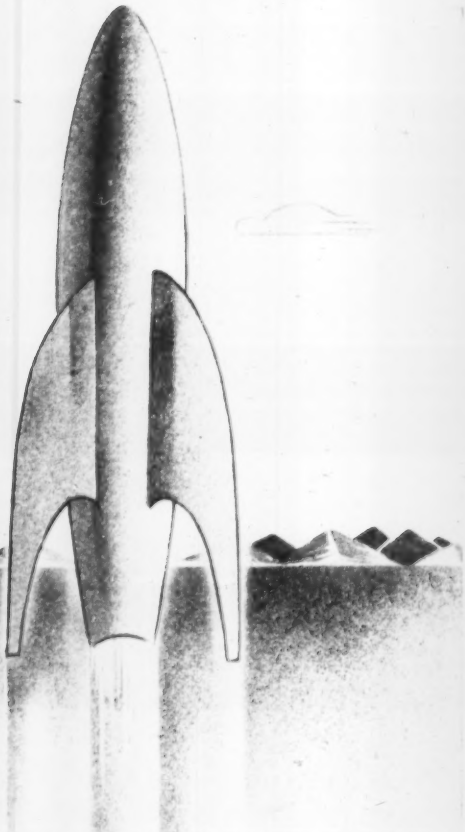
THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING

true and accurate as B&L ground and polished shafting



Many economy-minded firms are meeting today's top specifications at new low costs by taking advantage of the precision-plus qualities of B&L Ground and Polished Shafting. This prime material insures easier manufacturing all along your production line. It provides a smooth, mirror finish which saves machining time where the bar surface is retained in the completed work. Its consistent close tolerances in size, straightness and roundness save time in assembly and assure accurate and uniform finished products for cut-from-the-bar parts or precision shafts. Keep down your costs by using B&L Ground Bars that come to you properly cold worked and accurately sized and finished for your products.

Also COLD DRAWN SHAFTING; DRAWN, GROUND AND POLISHED; TURNED, GROUND & POLISHED. Standard or special Analysis. Plain or Furnace-Treated including Strain-Tempered.

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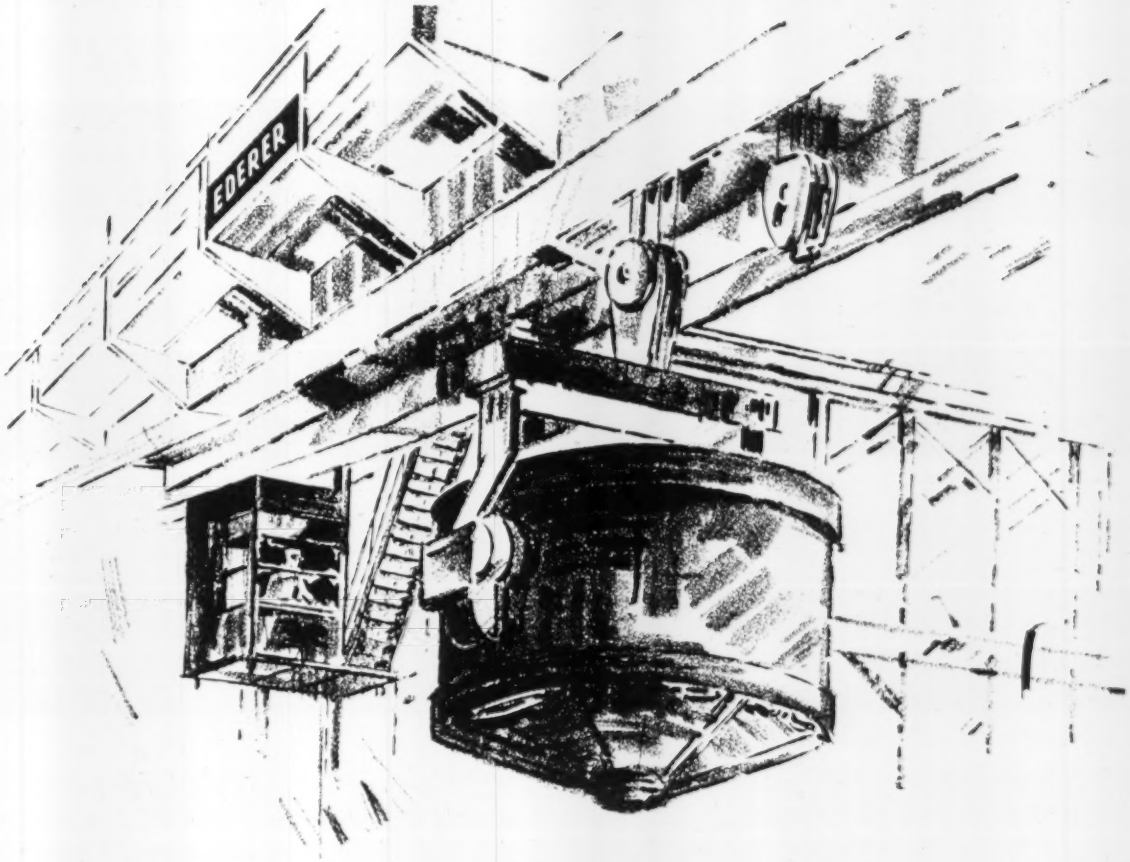
SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS: HARVEY, ILL. • DETROIT, MICH. • BUFFALO, N. Y. • MANSFIELD, MASS.

SINCE 1891



For rugged steel mill service

Steel mill service demands rugged performance in a crane — three gruelling shifts a day, 365 days a year — with no time down for maintenance. This calls for a truly extra heavy duty crane such as this 50-ton, 75-foot span crane servicing an electric furnace in a large Western steel mill. It is one of many cranes EDERER has "job-engineered" to the specific requirements of the steel industry.

EDERER — one of the largest crane manufacturers in the West — can "job-engineer" a crane to your requirements. Delivery can be made to meet your schedule for plant expansion or new construction.

Write for Crane Bulletin CR-500

223C53

EDERER ENGINEERING COMPANY • 2931 First Ave. So. • Seattle 4, Wash.

Export Division: 301 Clay St., San Francisco 11, Calif.

OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

EDERER

CRANES

ANNOUNCING A NEW

Gerrard Tying Machine...

FULLY AUTOMATIC B.S.M. TWINE SEALING MACHINE

• Here's a new, completely automatic tying machine that may fill a need in your plant . . . the Gerrard B.S.M. Twine Sealing Machine. Just place the bundle in the tying area, step on the pedal, and in three seconds, the twine is wrapped around the bundle, drawn to a pre-set tension, securely fastened with a *metal seal*, and cut. The bundle is firmly gripped and the tie will remain neat, strong and tight until the twine is cut. Several ties can be put around a bundle as quickly as it can be moved into position.

Look around your mailing or shipping department. There may be several spots where a Gerrard B.S.M. Twine Sealing Machine can save you time and money, and do a better tying job at the same time.

SEND FOR FOLDER DESCRIBING THE GERRARD TWINE SEALING MACHINE. IT'S FREE.

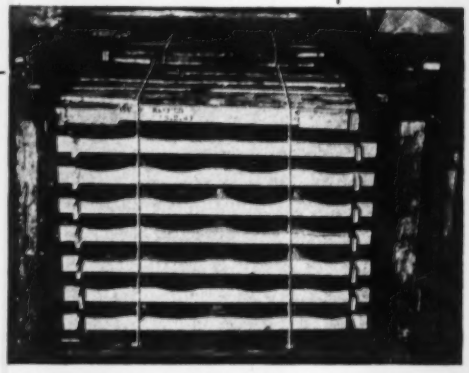
THE GERRARD B.S.M. TWINE SEALER IS completely automatic, makes a 1-cycle wrap, and secures the twine with a metal seal so firmly that the twine will break before the seal will slip. Bundles are limited to a 14" width and a 9" height.

On heavy tying jobs... be safe... save money... use Gerrard Steel Strapping

• Gerrard Round Steel Strapping, in 8 to 18½ gauge, was designed for safe, dependable, easy strapping of small packages, larger cartons and crates, heavy cases, pallets, and for reinforcement of carload lots of steel pipe, plates, sheets and machinery. With Gerrard's hand-operated machines, or the semi-automatic Model Q, you can make firm, tight closures or secure reinforcements that will keep your shipments safe from plant to destination. And Gerrard Round Steel Strapping costs about 40% less than any other metal reinforcement.

ASK US FOR FULL INFORMATION

Phone, write or wire for further information about the Gerrard Method of Steel Strapping or of Twine Sealing. A Gerrard engineer will gladly call, without obligation, to discuss your packaging and bundling requirements. Also ask for a free copy of the Blue Book of Packaging.



BRAKE DRUMS are palletized for inter-plant shipment, a good example of what can be done with small, odd-shaped units. 10 gauge Gerrard Round Steel Strapping holds the pallets securely.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
4745 South Richmond St., Chicago 32, Ill.

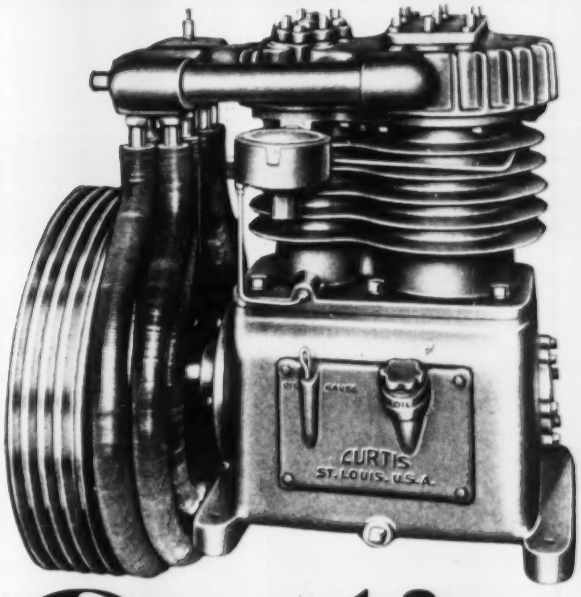
U·S·S GERRARD STEEL STRAPPING

USS

UNITED STATES STEEL

MORE AIR Per Horse Power

- IT'S TWO-STAGE
- IT'S AIR COOLED
- SELF OILING



The New Curtis

MODEL 98 AIR COMPRESSOR

TWO-STAGE AIR COOLED 15 AND 20 HORSEPOWER

TWO-STAGE — More air per kilowatt hour, assuring savings in power bill.

AIR-COOLED — No expensive water bills; eliminates plumbing installation costs.

INTERCOOLER — Four section, finned, providing unusually effective cooling between stages; cooled by cyclone of air from fan flywheel.

SELF OILING — Simple, positive centro ring method; provides pressure lubrication of connecting rod and pistion pin bearings.

TWO TIMKEN MAIN BEARINGS — Tapered rollers; provide easy adjustment made externally without dismantling compressor.

VALVES — Readily removable as assembled units without removing cylinder head or breaking pipe connections or gasket joint.

CRANKSHAFT — Counterbalanced, drop forged — two main bearings — no overhung bearing.

PRECISION WORKMANSHIP — Assures long life and minimum maintenance.

EXPERIENCE — Backed by 99 years of manufacturing — assures you dependable, troublefree service.

Available as a simple compressor or base mounted — motor driven.

LET ONE MAN DO THE WORK with this Curtis air-operated equipment.

AIR CYLINDERS — for almost any pushing, pulling or hoisting operation.

AIR HOISTS — for low-cost lifting or lowering of materials or machines.

-726

CURTIS PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Co.
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I am interested in items checked below:

☐ THE NEW MODEL 98 ☐ AIR HOISTS ☐ AIR CYLINDERS
☐ AIR COMPRESSOR

Name.....

Firm.....

Street.....

City.....Zone....State.....

CURTIS PNEUMATIC MACHINERY DIVISION of Curtis Manufacturing Company

1996 KIENLEN AVENUE ST. LOUIS 20, MO.

STEEL WOOL bursts into flame under a jet of fluorine gas in an experiment at The Whitemarsh Research Laboratory of The Pennsylvania Salt Manufacturing Company.

When Metal Bursts into Flame

Imagine, if you can, an element so fierce it burns up steel. One that claws its way through fire-brick . . . makes water burn like alcohol . . . destroys almost everything it touches.

That's fluorine for you!

And for over two hundred years chemists racked their brains to find some material that would hold fluorine. Hold it for even a few minutes' study.

Numerous materials — all considered dependably resistant to corrosion — were tried. Most went up in a flash.

Some few seemed to work, momentarily. But let temperature rise a trifle, or pressure build up . . . or a trace of moisture seep in . . . then dig out the wreckage and start over.

Finally Nickel and its alloys were tried. They work. They last for months where other materials failed in days or weeks.

Today, you find Nickel and Inco Nickel Alloys in equipment that produces fluorine . . . in pumps and piping and valves where fluorine is compressed, stored, and processed. Nickel and Inco Nickel Alloys hold fluorine, even under heat and pressure. By the way, if you would like to know more about fluorine, ask us for a copy of "Fluorine Makes Its Debut."

When you have a metal problem

If it's corrosion, it can't be any tougher than that caused by fluorine . . . and the solution may be found in Inco Nickel or one of the Inco Nickel Alloys.

Inco corrosion engineers are ready to help you. They've prepared a Corrosion Data Work Sheet to make it easy for you to outline your problem to them. Write for it, without obligation, of course.

• • •

Or perhaps your metal problem concerns temperatures—high or low . . . stresses or fatigue resistance. Whatever it may be, Inco engineers will gladly help you find the answer. The International Nickel Company, Inc., 67 Wall St., New York 5, N. Y.

Inco Nickel Alloys

Monel® • "R"® Monel • "K"® Monel "KR"® Monel • "S"® Monel • Nickel Low Carbon Nickel • Duranickel® • Inconel® Inconel "X"® • Incoloy® • Nimonics®

STEEL

The Metalworking Outlook

March 9, 1953

Big and Early

Iron ore shippers are looking forward to what may be their biggest season and earliest opening in history. Freighters will start plying the upper lakes by Mar. 15. The goal for 1953 is 103 million tons of ore. Previous record was about 92 million tons in 1942. Last year, with two months lost due to the steel strike, shipments were 75 million. Ice conditions on the upper lakes are much better than usual and many freighters already are being manned in readiness for early sailings.

No Slackening

A. F. Franz, Colorado Fuel & Iron president, adds his voice to those steelmakers who predict capacity operations through 1953. Mr. Franz is confident that operations in the West will be maintained at full capacity. The picture in the East may be a little softer, with some easing in wire demand later in the year.

Pop in Cans

Major can producers are casting covetous eyes at the soft beverage market. Cans now are being made for large-scale consumer testing this summer. The unknown quantity is the reaction of pop drinkers. Pepsi-Cola is supporting a consumer research program. If the idea of pop tin cans takes hold, it may open an important new market for tin plate.

Labor "Korea" in Detroit

Labor observers in the automotive capital believe major auto builders may try to stall the United Auto Workers-CIO at the bargaining table while production is pushed hard this spring. By May or June they could have a fair backlog of cars and be in a stronger position to resist heavy union demands.

Price of Being Basic

Prolonged subjection to government price controls is the price the steel industry is paying for being so basic to our economy. While price controls have been lifted from various other materials and products, they still remain on steel. An exception is the charge for conversion of steels. It was decontrolled last week. A general increase in steel prices is not in the cards, but you can look for some adjustments, most of them upward, needed to correct imbalances that have arisen in a price structure made rigid by government controls. Growing competition will help keep any increases moderate. Already a few sellers have shaded prices.

We'll Still Have Controls

Government controls on distribution of steel, copper and aluminum will not disappear entirely on June 30 when the present Defense Production Act expires. Enough controls will be retained to assure

Production Engineering News p. 93 The Market Outlook p. 175

materials for military and atomic energy requirements. Under consideration in Washington are three systems for giving priority to defense requirements after June 30: 1. A simple DO (defense order) rating band. 2. A "little CMP." 3. A programming set-up in which task forces from the steel, copper and aluminum industries would confer with the armed services, AEC and other qualified claimants to ascertain requirements and parcel them out on the basis of capacity relationships of the various producers. In effect CMP will be open-ended for all civilian uses of steel, copper and aluminum. Now it's open-ended only for any portions of these materials produced in excess of military needs and CMP allotments to civilian users.

Advisory Groups To Stay

National Production Authority will be continued after June 30, although it will be cut down substantially from its present size. This means that the 554 industry advisory committees with more than 7000 industrial members will be maintained. The industry committees at present are the most important means of government-industry cooperation.

FTC Leans Republican

Republicans will gain a three-to-two majority in the Federal Trade Commission next September when a successor to Stephen J. Spingarn is appointed. Last week President Eisenhower nominated Republican Edward F. Howrey, Washington attorney, to a seven-year term. Mr. Howrey is a specialist on antitrust and corporation law.

Straws in the Wind

You may list as income tax deductions retroactive payments of wage and salary increases agreed on during the control period but not put into effect until after decontrol . . . Detroit area soon will get more locally-produced cold-finished bars: Bliss & Laughlin will open a new plant there next month . . . The Air Force, which halted all disposal of its excess equipment at the outbreak of the Korean war, will resume sales of such equipment.

What Industry Is Doing

Steel warehousemen are looking forward to a year of satisfactory operations (p. 65) . . . Expansion projects by Bethlehem Steel and Youngstown Sheet & Tube will boost the nation's iron and steelmaking capacity (p. 66) . . . Warehouses and automotive companies in 1952 took 36 per cent of the steel shipped from mills (p. 68) . . . A new organic coating—hard enough for home appliances, yet flexible enough for application before the metal is formed—has been developed by Glidden Co. (p. 68) . . . Hazards lurk for defense producers in the Air Force's ruling on contract terminations (p. 70) . . . Machine tool builders expect improved backlogs now that they may work on unrated orders for Appendix D tools as NPA amends its Order M-41 (p. 71).

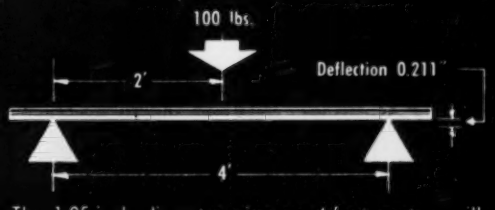
High strength for light structurals with Armco Welded Tubing

Armco Welded Steel Tubing provides a tailored-to-order steel for light structural applications that gives you an excellent combination of high strength per pound and attractive appearance.

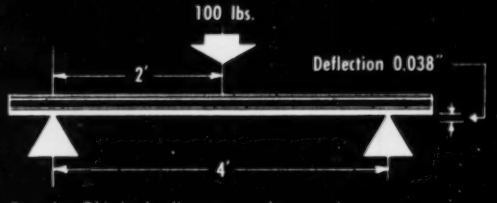
Within practical limits, the larger the tube or special section and the lighter the wall thickness, the greater is its structural efficiency.

For example, a welded steel tube and a standard steel pipe serve as a basis of comparison. The tube tested here is 2¼-inch outside diameter with 18 gage (0.049-inch) wall thickness; the standard steel pipe has an outside diameter of 1.05 inches, a wall thickness of 0.113-inch. Both tube and pipe are about the same weight.

WHEN LOADED AS A BEAM



The 1.05-inch diameter pipe on 4-foot centers will deflect 0.211-inch under a 100-pound load.

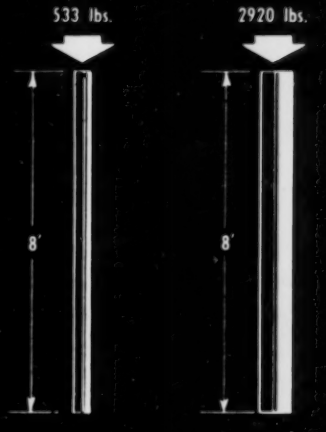


But the 2¼-inch diameter tube on the same centers will deflect only 0.038-inch under the same load.

LESS THAN ONE FIFTH THE DEFLECTION WITH THE SAME AMOUNT OF STEEL!

(Besides having lower deflection the welded tubing has about two and one-half times the safe load-carrying capacity of the pipe.)

WHEN LOADED AS A COLUMN



The 1.05-inch diameter standard pipe has a safe load-carrying capacity of only 533 pounds.

While the 2¼ inch diameter welded tube can carry a load of 2920 pounds with safety.

MORE THAN FIVE TIMES THE LOAD-CARRYING CAPACITY WITH THE SAME AMOUNT OF STEEL!

If you are not familiar with the many applications for Armco Welded Steel Tubing, or the methods of assembling it, write for these booklets: "Armco Welded Steel Tubing" and "How to Fabricate Armco Tubing."

ARMCO STEEL CORPORATION

ARMCO

2233 Curtis Street, Middletown, Ohio

Export: The Armco International Corporation

1 LOW INITIAL COST

2 SIMPLE CONSTRUCTION ...easy to maintain

Good Reasons for Specifying EC&M Control for Skip-Hoists

In addition to low initial cost and simple, easily maintained construction, EC&M Control gives highly desired flexibility and top-notch efficiency on the straight part of the skip-incline. It also provides utmost accuracy in stopping.

When building new furnaces or modernizing existing installations, consult with EC&M, without obligation, of course.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

Signal for a Change

What happens as a result of the incapacitation of Premier Joseph Stalin can be of the utmost importance to the United States. Ever since the Bolshevist revolution, democratic nations have found it increasingly difficult to deal with the Soviet rulers. Each change of premiers has precipitated new problems in world relationships and there is every reason to expect that the shift of power from Stalin to his successor will be accompanied by similar, if not more troublesome, repercussions.

In considering future relations of the United States with Russia it is well to remember the difficulties of the past. Through the thirties and the first half of the forties, the leading democratic nations were compelled to deal with an unprecedented number of powerful dictators. In the period when Hitler, Mussolini, Hirohito and Stalin were in the ascendancy, their technique of direct, personal action in handling foreign relations put a terrific strain upon the state departments or foreign offices of free nations.

As a natural result of this, it became more and more the practice of the leaders of western powers to deal personally with the dictators. Fateful examples were the attempts of Prime Minister Churchill and Presidents Roosevelt and Truman to negotiate with Premier Stalin by means of personal conferences at Yalta and Potsdam. Today there is widespread opinion that serious mistakes were made by our representatives at these conferences.

In light of these mistakes and of other instances where our relations with Russia have been unfortunate, it would seem that the departure of Premier Stalin from office should be the signal for a complete change in our methods of dealing with the ruler or rulers of the Kremlin.

We would like to think that no American President again will go into a huddle with a Red dictator with the cocksure feeling that by personal charm he can "get along with" him or outwit him.

Henceforth, let all of our dealings with the Kremlin be out in the open, so that the Congress and the people can know what is going on and so that no "secret" understandings can be reached.

E. C. Shaner

EDITOR-IN-CHIEF

AMERICAN INSTITUTION: During the past half-century, trade associations have grown in number and in influence to the point that today they are recognized as one of the most important institutions in the American industrial system. From 250 in 1910 (p. 76), trade associations have grown in number to 1600 in 1953, of which 425 are serving the metalworking industry.

The secret of the success of a trade associa-

tion is simple. Assume that there are 100 companies manufacturing a certain product. Somebody suggests that they form an association. About 65 of the 100 join as charter members. If the association is well managed, it soon becomes apparent that there are many things which members can do co-operatively which none of them could afford to do individually. Membership grows until only a negligible minority of eligible companies remains outside.

A good trade association helps members solve many internal problems but in most cases it also does a good job of making the government and the public cognizant of the importance of the group it represents.

* * *

TRADE PLAN DUE SOON: In 1952, U. S. exports totaled $15.2 billion, a new all-time high. In the same year imports climbed to $10.7 billion. Of the $4.5 billion excess of exports over imports (p. 75), about $2 billion represented shipments of military equipment to friendly nations to help them to meet the threat of Communism.

How to increase imports is one of the most pressing problems of the Eisenhower administration. Its foreign trade policy should be pretty well formulated before the Reciprocal Trade Agreements Act expires on June 12. The administration seems to favor the principle of low tariffs but with the hedge that provision must be made to limit the adverse effects upon domestic production in certain industries.

Perhaps the picture is distorted by an excess of publicity on such items as briar pipes, watches and cheese. Possibly more serious attention to imports of certain strategic materials of which there is no domestic source of supply might help to outline the problem in clearer perspective.

* * *

TREND AGAIN IS RISING: Sharp-eyed observers will have noticed that industrial activity has taken a new lease on life. About three weeks ago production in the metalworking industry was in a sidewise movement. Since then it seems to have managed to get off dead center and has been moving ahead rapidly.

U. S. output of passenger cars and trucks in the last week of February was at the highest level in 21 months. Electricity output (p. 83) is running about 10 per cent ahead of comparable weeks a year ago. Steel ingot output has risen above the 100 per cent of capacity mark and is within range of new records almost any week. Revenue freight car loadings remain the only weak sister of the four basic indicators. They lag about 4 per cent behind those of a year ago.

* * *

INCOME SPREAD WIDELY: At the 13th Freedom Forum held recently at Harding College at Searcy, Ark., simplified figures were presented as to the distribution of national income. The breakdown showed that 65 per cent goes to employees, 9 per cent to professional men and unincorporated business, 7 per cent to farmers, 4 per cent to landlords, 4 per cent to stockholders, 4 per cent to bond holders and other lenders, 2 per cent back into the business for expansion and 5 per cent to taxes.

Another interesting fact, derived from research conducted by the University of Notre Dame, is that 73 cents out of every dollar of interest, dividends and rent payments to individuals go to people with less than $100-a-week incomes. Figures of this kind reflect a widespread distribution of income, which is one of the nation's greatest assets.

* * *

THEY SEE THE LIGHT: Norman Thomas perennial candidate of the Socialist party for President of the United States sometimes impresses radio listeners by the restraint with which he advocates his beliefs. Recently he issued a pamphlet entitled "Democratic Socialism A New Appraisal," which is significant from several angles.

For one thing, he confesses that many of his ideas have been proved false. "The working class is not the Messiah which some of us thought." Capitalism is not necessarily the cause of war, nor is Socialism "a panacea against war." State ownership should not be carried too far, because big government under any auspices becomes oppressive.

Here is an honest confession of disillusionment. It does not mean that he renounces his basic tenets in entirety. It means he adjusts them in conformity with reality. Conscientious advocates of this or that "ism" should follow his example.

VALLEY MOULD AND IRON CORP.

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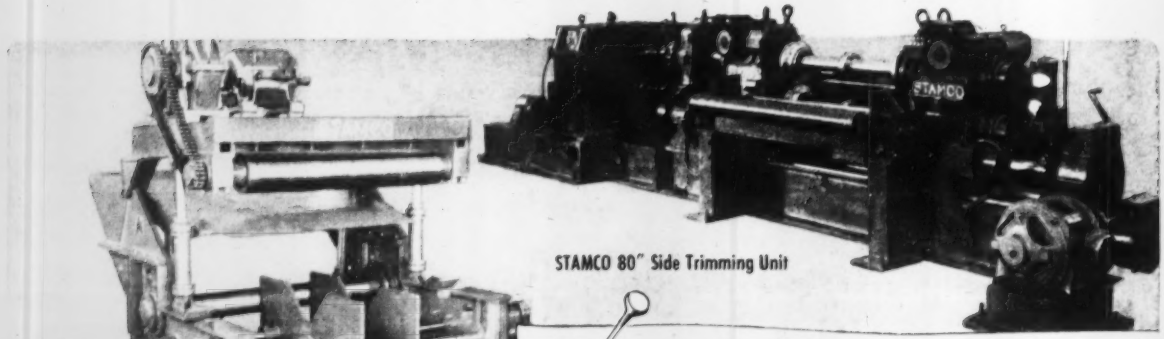
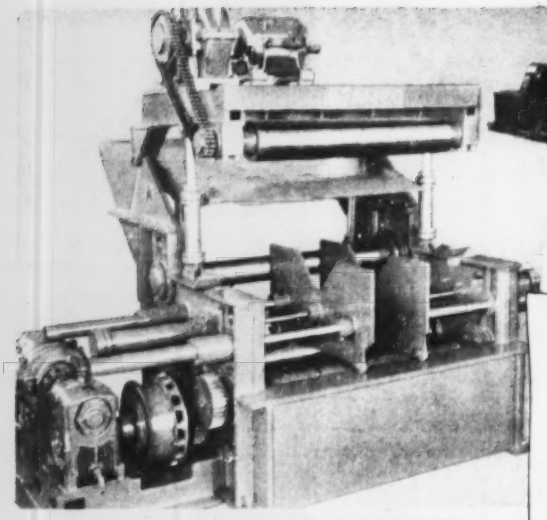
Western Office: Chicago, Ill. • Northern Office: Cleveland, O.

For Special Operations in Steel Mills...



STAMCO 80" Side Trimming Unit



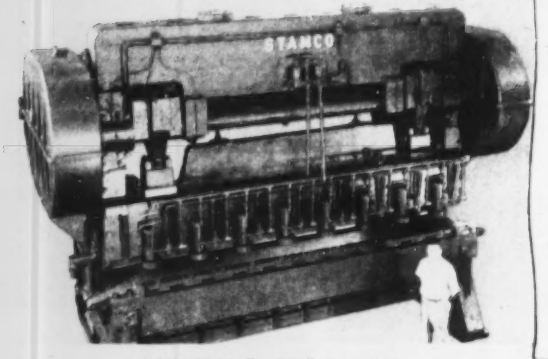
STAMCO Coil Box, coil opener and feeding unit

Call or write

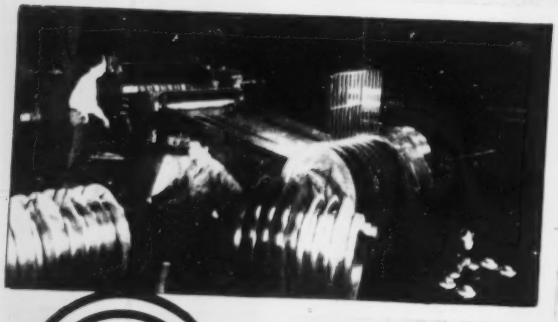
Stamco

for the equipment you need

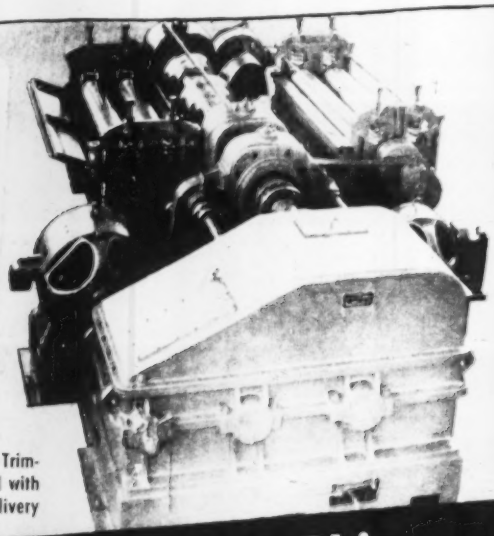
For mill or warehouse use on ferrous or non-ferrous material, STAMCO has a model or size to fit your needs—or can make it for you. If you use trimming units, plate shears, slitting units, coil openers or any other special steel mill equipment, it will pay you to write us. No obligation.



STAMCO 1¼" x 180" plate shear



STAMCO 48" Slitting & Coiling Line 15000# coil capacity

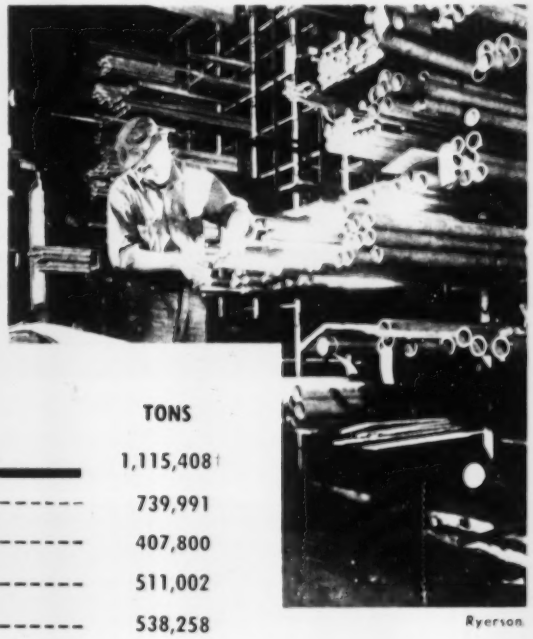


STAMCO 72" Heavy Gauge Side Trimming and Slitting Unit equipped with a double set of feed and delivery pinch rolls.

• LAY YOUR SHEARING PROBLEMS AT STAMCOS DOOR •

STAMCO, Inc., New Bremen, Ohio

STEEL WAREHOUSES: Business Still Good



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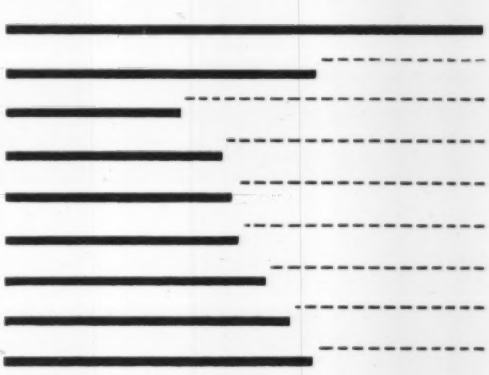
*Steel Warehouse Inventories**



	TONS
Sept. 1, 1949	1,115,408†
Sept. 1, 1950	739,991
Sept. 1, 1951	407,800
Sept. 1, 1952	511,002
Oct. 1, 1952	538,258
Nov. 1, 1952	555,192
Dec. 1, 1952	616,537
Jan. 1, 1953	685,220
Feb. 1, 1953	729,793

* American Steel Warehouse Association survey of 112 companies with 147 warehouses.
† Considered normal by most members of the industry.

STEEL WAREHOUSEMEN in general are looking forward to another year of satisfactory operations. Demand is substantial at least on a par with six months ago and inventories are averaging 65 per cent of normal, which is nearly back up to the level of Sept. 1, 1950.

However, not everywhere is the future so bright. Imbalance continues to plague almost everybody, and some areas are still starved for many items.

Demand Holding Up—Although there are exceptions, most warehouse operators report that demand is comparable to September, 1952. There is some easing in certain areas, part of which is seasonal, but the general level of business is still high. In other areas, such as Detroit and the South, demand is considered higher. In the former, the heavy demands of the auto industry keep the warehouses hopping, but in the South, a traditional lack of facilities accounts for much of it.

The table above, which represents about 60 per cent of the nation's steel warehouse business, indicates that inventory tonnages are climbing back to a more normal level. But again, individual inventory positions depend on location and other factors. For instance, southern firms must compete with northern houses for most of their products which are produced in northern mills. Consequently, they have only a 30 per cent normal stock, and that is badly imbalanced.

Same Old Story—Imbalance continues the main characteristic of practically every warehouse, even those with good tonnage inventory. Some of the "critical" materials are reported taking up far too much storage space, mainly because they are so closely controlled that few persons can buy them. Nickel-chrome stainless is one example. Alloy steels are reported in good supply, but there is not enough equipment available to heat treat them.

Choosy—A sign of better things to come is the fact that many dealers are getting choosy about what they accept from the mills. After the steel strike, they took anything the mills shipped them, but not so now. On the other hand, they still find most items are hard to come by. Still in tight supply are the heavy articles: Plates; structurals especially wide-flanged beams; large bars, rounds and flats. Both cold-rolled and hot-rolled sheets and some seamless tubing are critical.

Detroit seems to hold the answer to the sheet problem. If automakers succeed in selling all the cars they can make, sheets will continue to be tight. If not, an

easing should show up by midyear. Midyear could see also a break in heavy plate and structurals.

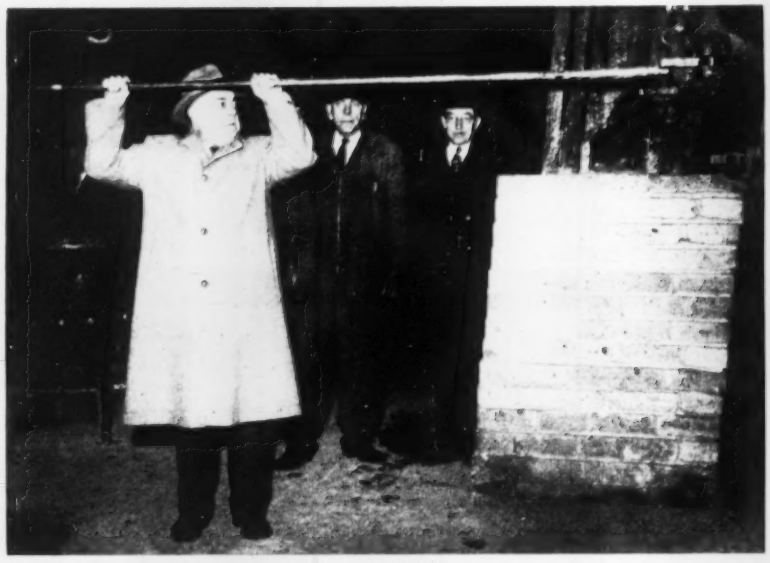
Who Wants Galvanized?—About the only item in good supply practically everywhere is galvanized sheet. Rumors of price weaknesses on that have shown up in some areas.

As the warehouse position returns more to normal and competition becomes keener, a problem vexing the dealer is what to do about the mill buyers who turned to the warehouse as an emergency measure. At present, there is little loss of those customers, because the mills still cannot handle them well enough. However, their pounds per order are falling off.

A Matter of Service—Many warehousemen feel that they will retain at least a portion of that business. They take pride in the services warehouses can offer which mills cannot. They point to the high cost of storage which quantity buying from the mill involves. But others, perhaps more realistically, realize that some manufacturers cannot afford the extra costs.

The job of retaining as many of those accounts as possible and getting new ones as competition returns will fall to the sales staffs. Most dealers are stepping up their sales efforts, although few will admit that they were ever curtailed even when there was nothing to sell. Not many new men will be added, but the old timers will have to dig deeper. Few of them ever sold in a truly competitive market, so they will have to be reeducated in some cases.

Stimulus—The return to competitive markets, nearly everyone feels, could be hastened greatly by the quick and complete end of CMP. Especially older and bigger warehouses which have stronger historical ties with mills feel that they should be allowed to stock as much of an item as they need and can get through regular business channels. However, the newer and smaller dealers hesitate to condemn CMP for fear they will lose out in the shuffle. John Doxsey, assistant to the president of the American Steel Warehouse Association, says there is some sentiment in and out of the industry for a "Little CMP" to replace the present plan.



Youngstown Sheet & Tube lights new furnace as . . .

Two Companies Conduct Expansion Programs

EXPANSION projects at two steel companies will boost the nation's iron and steelmaking capacity.

Bethlehem Steel Corp.'s annual capacity will rise from a current 17.6 million tons to at least 19 million tons when present expansion and modernization is completed. Meanwhile, Youngstown Sheet & Tube Co. lighted its No. 3 blast furnace at the Indiana Harbor Works, East Chicago, Ind.

At Indiana Harbor — Youngstown's new furnace is the third major unit to go into production since the company launched its building program at Indiana Harbor in 1950. The furnace is 105 feet high and has a 28-foot diameter with a rated capacity of 1500 tons a day. It is equipped with three stoves for preheating air.

An open hearth department of eight 250-ton furnaces went into production last May at Indiana Harbor and a 75-oven coke battery began production last fall. A blooming mill and a cold rolling unit are under construction.

Bethlehem Improvements — Expansion at Bethlehem plants includes two blast furnaces at Bethlehem, Pa., and one at Sparrows Point, Md., as well as additional coke oven capacity at four manufacturing plants and miscellaneous additions to finishing facilities.

Spokesmen of Bethlehem Steel Corp. say that increased facilities cannot indefinitely offset mounting costs of recent years. Despite the reported expansion, they point out that costs lowered the net income per dollar of sales from 8.5 cents in 1950 to 5.9 cents in 1951 and 5.3 cents last year.

CF&I To Improve Facilities

Colorado Fuel & Iron Corp., ninth largest steel producer in the U. S., is planning to spend $20 million on production facilities in the next few years. Most of this outlay will be used to improve currently-owned facilities, rather than to purchase new companies, says C. F. Franz, president.

The corporation in a recent expansion program spent $30 million on new production facilities. Much effort went toward product diversification. C F & I in 1930 devoted 70 per cent of its finished steel production to rails and fastenings; this figure is now 15 per cent, due to development of other products. Rails and fasteners are still the largest items, however.

Soon to contribute to the diversification effort will be a seamless tube mill at Pueblo, Colo., the only such mill west of the Mississippi. This mill is scheduled to start operating in September of this year.

Hot Squeeze Put on Tough Alloys

National Tube uses the Ugine-Sejournet process to produce seamless tubing and special shapes from high-alloy steel. Monthly production is expected to reach 2000 tons

HIGH-ALLOY stainless steel tubing and shapes are being "hot extruded" by the Ugine-Sejournet process at U. S. Steel Corp.'s National Tube Division plant in Gary, Ind.

"Using this operation, the Gary plant can now produce seamless tubing from nonpierceable grades of stainless steel and extrude unusual shapes that defied all rolling methods because of their unbalanced design," says J. E. Goble, president of National Tube Division. Production is expected to be about 2000 tons of tubing and shapes a month, he adds.

Plastic Steel — The process squeezes steel slugs heated to about 2250 F to make them plastic with the pressure coming from a 2500-ton hydraulic press that forces the steel through a forming die. Pressures and working temperatures are so high that glass is used as a lubricant (see STEEL, June 2, 1952, p. 92).

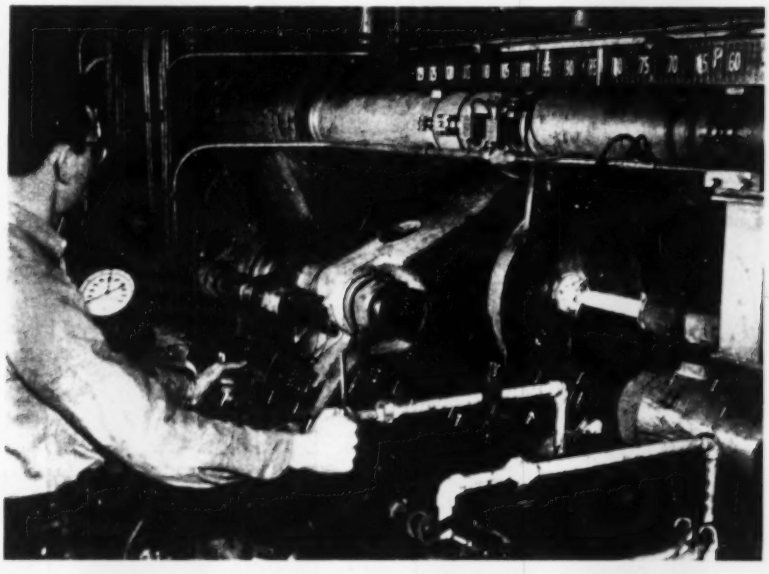
Steel billets, supplied by other U. S. Steel mills, are cut by four circular saws, weighed, and in some cases the leading ends of the slugs are chamfered. For production of small stainless steel tubing, the slugs also must be drilled on one end to help the steel flow in the press. To handle the slugs by overhead conveyor, a specially headed flux-filled stud is welded to the end of each slug by the stud welding process (see p. 110).

Before the Squeeze—Slugs pass through a 3-zone, gas-heated furnace, producing maximum temperature of 2400 F, and through a barium chloride bath, where temperatures up to 2300 F can be maintained. From the salt bath, slugs are conveyed to a charging buggy and the welded stud is cut off with an air-driven chisel. A sheet of glass fiber wraps around the slug as it rolls into position before the press.

Before extruding pressure is applied, the slug case is packed with sandwiches of woven, pane, spun or other forms of glass, depending on the type of extrusion and composition of the steel. In addition, a knitted fiber-glass "stocking" is fitted to the mandrel which pierces and shapes the inside of the tube as it travels through the die. Heat and pressure reduce the glass to a viscous liquid which serves as a lubricant.

No Hot Fingers—The extruded product leaves the die by means of an outlet conveyor and can be dropped into a water-quench tank or onto an air-cooling rack. Both the press and its auxiliary equipment are fully instrumented and all controls are automatic.

At present the press is capable of producing seamless tubing $1\frac{1}{2}$-inches to $5\frac{1}{8}$-inches in outside diameter, though, with additional tooling, sizes up to $6\frac{1}{4}$-inches are possible.



PREPARING TO EXTRUDE HIGH-ALLOY STEEL
. . . "glass stockings" on the mandrel help the flow

McKee To Build Blast Furnace

Arthur G. McKee & Co., Cleveland, has contracted to build for the American Steel & Wire Division of United States Steel Corp. what is expected to be the world's largest merchant iron blast furnace. The new unit, with an estimated capacity of 1350 tons per day, will be constructed at AS & W's Central Furnace & Docks Plant in the Cuyahoga valley.

Name Steep Rock Manager

A. J. Cayia, manager of Inland Steel Co.'s iron mines and quarries, will direct development of the company's $50-million iron ore project in Steep Rock lake, northwestern Ontario. Inland has leased the property from Steep Rock Iron Mines Ltd. (STEEL, Mar. 2, p. 61).

Write-Off Certificates Issued

Office of Defense Mobilization in the two weeks ended Feb. 25 issued certificates of necessity for rapid tax write-offs on 233 new or expanded defense facilities, valued at $334.6 million. Among the largest certificates were those to Kaiser Aluminum & Chemical Corp. and United States Steel Corp. Kaiser received an amortization certificate to build at Mentor, Ky., an aluminum plate and sheet mill valued at $66,052,000, with 50 per cent allowed. U. S. Steel Corp. was issued a certificate for expansion at Two Harbors, Minn., of iron ore sintering facilities, valued at $60 million, with fast write-off on 65 per cent.

Who Got the Steel

Warehouses and automakers accounted for over one-third of last year's shipments

THE TWO biggest takers of steel from this country's mills continued in 1952 to be warehouses and the automotive industry.

A compilation by the American Iron & Steel Institute shows warehouses received 19.8 per cent of mill shipments of 68,003,612 net tons of finished steel in 1952. The automotive industry got 16.2 per cent. These percentages gave warehouses 13,327,799 tons of finished steel, the automotive industry 10,852,075 tons.

In 1951, warehouses received 18.5 per cent of mill shipments and the automotive industry, 16.7 per cent.

More for War—Continuation of the Korean war is reflected in shipments for ordnance and other military. This classification's share in 1952 was 3.1 per cent, compared with 1.5 per cent in 1951.

The portion going into export rose from 3.6 per cent in 1951 to 4.9 per cent in 1952.

Total mill shipments of 68,003,612 net tons in 1952 were off, because of strikes, nearly 11 million tons from the record year of 1951. While the loss of production time was 16.7 per cent of the year, shipments were off only 14 per cent from 1951, reflecting the rapid post-strike recovery.

Reflection of Controls—Analysis of the 1952 shipments by products reveals the effect of the defense program and government controls on steel distribution. Bars and semifinished steel made up a greater proportion of total shipments in 1952 than in 1951 as a result of the emphasis on ordnance. Pressure tubing, essential for industrial power plant expansion and various military items, showed an increase in tonnage over 1951.

Casualty—Light flat-rolled products in general were reduced in their proportion of total shipments, corresponding to the reductions to the automotive and other consumer goods markets. Furthermore, the facilities for rolling light flat products were used to a large extent in production of plates for defense needs.

Details on distribution of finished steel in 1952 to market groups are shown in the table.

WHERE THE STEEL WENT IN 1952

Mill Shipments of All Grades of Finished Steel

MARKET CLASSIFICATION	NET TONS	% TOTAL
Steel for converting & processing	3,040,819	4.5
Forgings (other than automotive)	1,437,436	2.1
Bolts, nuts, rivets & screws	1,300,862	1.9
Warehouses	13,327,799	19.8
Construction, incl. maintenance	7,800,753	11.6
Contractors' products	2,609,809	3.9
Automotive	10,852,075	16.2
Rail transportation	3,987,118	5.9
Shipbuilding & marine equipment	1,027,064	1.5
Aircraft	137,275	0.2
Oil & gas drilling	770,255	1.2
Mining, quarrying & lumbering	311,703	0.5
Agricultural	1,347,835	2.0
Machinery, indust. equip. & tools	3,791,528	5.7
Electrical machinery & equip.	1,605,448	2.4
Appliances, utensils & cutlery	1,362,886	2.0
Other domestic & comm'l. equip.	1,562,856	2.3
Containers	5,546,781	8.3
Ordnance & other military	2,096,711	3.1
Total domestic	63,917,013	95.1
Export	3,269,624	4.9
Total	67,186,637	100.0
Shipments of nonreporting companies	816,975	
Total shipments	68,003,612	

American Iron & Steel Institute

Porcelain paint in twist test shows . . .

Super Organic Finish

COMBINATION of durable qualities reach an all time-high for an organic coating in Glidden Co.'s new silicone resin base finish.

Known as Nubelon S, the finish is harder, tougher and yet more flexible than existing ones. Manufacturers of metal products have long sought a coating that combines surface hardness for abrasion resistance with flexibility. Tendency in the past was to lose hardness with an increase in flexibility.

Glidden chemists overcame the problem with an unusual modification of silicone resins. Results: A baking enamel hard enough for use on home appliances yet flexible enough to permit application before the metal is formed.

Figures Speak—Extent to which the new coating maintains its color under severe conditions and its extreme hardness and adhesion make it especially valuable as a white appliance finish. Taber Abraser wear tests give only 30 milligrams loss per 1000 revolutions. Tests of high quality alkyd-amine baking enamels show 66 to 100 per cent greater loss.

The new finish shows no appreciable corrosion after fog tests in 20 per cent salt spray for 4000 hours at 95 F. Actual figures: 0.03-inch creepage in 400 hours. Exposure in a standard humidity cabinet gives no change in 4000 hours. Basis of the tests are one

coat of the new finish compared with a high quality two-coat alkyd-amine system.

The coating resists staining of dyes, including mustard one of the most annoying stains with which home appliance manufacturers must deal and lipstick, coffee, fruit acids, hot soap and hot grease. Another point of interest heat resisting properties look good.

Where to Look—Characteristics of the finish recommend it for applications such as kitchen and laundry appliances, metal furniture, prefabricated farm buildings, silos, screening, hospital equipment and concrete forms. Fence wire coated with Nubelon S can be fabricated into fencing without chipping the surface.

The new finish is available in various shades of whites, grays, and yellows as well as blue, tan, green and red. It is more expensive than current standard enamels and requires baking at 425 F.

May Drop Advance Allotments

Look for cancellation of advance allotments of controlled materials placed in second quarter for third-quarter delivery when the Defense Production Act expires June 30. Washington agencies concerned with controls have reached virtual agreement on this. However, they think some provision should be made for military and Atomic Energy Commission requirements.

Three plans are in the discussion stage. They are: Simple DO rating system; Little CMP; and a board composed of task forces from the steel, copper and aluminum industries to parcel out materials to qualified claimants.

Regardless of which system is adopted, there is general agreement that the warehouse order M-6A will have to be continued in some form after June 30. That would take care of AEC and defense orders and provide for warehouse set-asides.

Do not look for much relief in nickel, though. The agencies think that full nickel control must be kept up after June 30. At present, however, NPA is preparing to raise advance allotments of nickel-bearing stainless for third-quarter delivery from 80 per cent to 100 per cent of the second-quarter consumption.

Bright Outlook Ahead for Window Makers

Prospects of an uncontrolled economy are encouraging manufacturers of metal windows, sash and storm doors

WITH MUCH to gain from lifting of controls, and little to fear from declines of defense orders, metal window producers generally have a clear view of prosperity in 1953.

The predominately civilian industry making storm doors and windows and metal sash is currently in a lull between the fall and spring heavy production periods. When the year's building construction begins in earnest, manufacturers of metal windows forecast sales gains of 5 to 15 per cent over 1952.

Contributing Factors — Among the reasons for industry optimism is the possibility of increased civilian building and the trend toward larger houses with more windows. Manufacturers of basement windows point out that hastily-built houses in the immediate postwar period used fewer cellar windows than are installed now.

In addition to housing sales, demand from schools and hospitals is heavy this year, and sales to constructors of commercial structures are increasing. Aluminum is gaining rapidly in usage, not at the expense of steel, but to the detriment of wood, which remains the leading material in window casements. In window sash, aluminum's lightness and corrosion resistance causes that metal to rival steel in use. A major handicap to aluminum is its higher price.

Combinations—Aluminum frame windows with removable screen and glass sections are increasingly popular. These "storm and screen" combinations, manufactured by companies such as Weather-Proof Co., Cleveland, Stetson Window Corp., Belmont, Mass., and Champion Windows Inc., Boston, permit quick changes from summer to winter positions. A new development at Weather-Proof Co. is an aluminum door with glass and screen sections which can be stored in a panel inside the door when not in use.

The feeling among industry members is that aluminum will grow into still greater favor in metal windows, now that the metal is in freer supply. Prospects for market expansion caused officials of Season-All Co., Pittsburgh, to remark that the storm window industry is still in its infancy. Others believe aluminum has gained in public acceptance over the past five years, promising a bright future.

Defense Contracts—Metal windows are intended almost completely for civilian production, but several companies round out slack periods with defense work. General Bronze Corp., Garden City, Long Island, N. Y., anticipated an acute aluminum shortage following outbreak of the Korean war, and took on stainless steel fabrication for aircraft. To do this, General Bronze installed special equipment, but did not change its regular production. A Cleveland manufacturer makes small aluminum parts for Air Force jet aircraft.

Among problems faced by metal window producers is the annual slack period, paralleling that experienced by construction. The slump occurs in February and early March, during which time companies renovate their plants and as many employees as possible take their annual vacations.

Spring Building—With the government loosening its reins on metals, sash and casement manufacturers think they can raise their capacity considerably this year. The spring building rush is close at hand and most producers think it will be a prosperous season.

Disk Whirls Into Production

Turbine disk for a J-47 jet aircraft engine whirls into production on a vertical turret mill at the Chrysler jet engine plant, Utica, Mich. Designed to spin at speeds up to 7000 rpm, the disk will be fitted with blades to form the heart of the J-47's air compressor. Navy-owned and operated by Chrysler Corp., the engine plant was built from scratch and producing within 15 months

Hazards Hide in New Contract Terminations

ARE DEFENSE contractors aware of their hazards under the new termination procedure?

That's the question some Washington lawyers are asking about the termination article finalized by the Air Force. The hazard is that the comptroller general and his General Accounting Office can challenge agreements reached by contracting officers with terminated contractors. Such interference could result in long delays, and in disallowance of important costs.

In Air Force Manual—Title of the Air Force article is "Termination of Contracts." It has been incorporated as Section VIII in Air Force Manual No. 70-6J covering "Air Force Procurement Procedures." Like Army and Navy articles, still in the review stage, it is based on Section VIII of the Munitions Board's Armed Services Procurement Regulation.

Washington corporation lawyers say a principal defect of Section VIII is a lack of statutory authority to the contractor to carry out his contract agreement to act as the government's agency in disposing of surplus property.

This is an important factor, for once the defense contract has been terminated, the contractor must prepare his plant speedily for normal peacetime employment. Under Section VIII there is no protection to the contractor from GAO questioning his right to clear the plant for peacetime retooling.

Property Disposal—Lawyers do not like the failure to spell out authority for disposing of property in subcontractors' plants. Section VIII gives contractors authority to settle on their own responsibility only such subcontractors' claims as come to less than $1000.

Among other provisions objected to is lack of interest on delayed payments to terminated contractors. In World War II, 2 per cent was allowed. Section VIII does not allow as costs the interest a contractor pays on borrowed funds, or the contributions he has to make for various reasons; such costs were allowed in World War II. Too, many fixed-price contracts are subject to redetermination. If the comptroller general were so minded, he could have a field day in this area.

What is needed, say the lawyers, is a peacetime Contract Settlement Act and a Surplus Property Act which will give both the armed services and contractors the protection they need in making termination settlements. Such proposals have been put forward in Congress, but they are not being pushed. In the meantime, lawyers fear, the contractor has a noose around his neck which could be drawn tight at the time for termination settlements.

Anaconda Starts School

Anaconda Wire & Cable Co. announces a program to combat the engineer shortage by means of a 13-week industrial engineer training course at Anaconda's Hastings-on-Hudson, N. Y., plant.

Anaconda's project has three objectives: To develop technically trained men with knowledge of industrial engineering theory; to equip these men with ability to impart the training to foremen, and to improve production.

Some 15 trainees took the course and have been assigned to various Anaconda mills to pass around benefits of the training.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Lathes	Robert R. Stephens Machinery Co., St. Louis
Link Loading Machines	Marnat Engineering & Machinery Works, San Francisco
Automotive Parts	International Harvester Co., Peoria, Ill.
Parts for Cranes	Baldwin-Lima-Hamilton Corp., Eddystone, Pa.
Parts for Rock Crushers	Pioneer Engineering Works, Minneapolis
Valves, Thermostat Control	Leonard Valve Co., Cranston, R. I.
Valves, Various Sizes	Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Radio Receivers	Motorola Inc., Chicago
Transmitters	Mackay Radio & Telegraph Co. Inc., New York
Sound Reproducing Units	Webster-Chicago Corp., Chicago
Bombs, 100 lb.	Allen Mfg. Co., Nashville, Tenn.
Fuzes, Grenade	Bayshore Industries Inc., Elkton, Md.
Fuzes	Stewart-Warner Corp., Alemite Div., Chicago
Adapter Grenades	Wald Industries Inc., Huntingdon, Pa.
Metal Parts for Boosters	Grand Rapids Hardware Co., Grand Rapids, Mich.
Parts for Electric Motors	General Electric Co., Schenectady, N. Y.

NPA Relaxes Order M-41

Toolmakers look for improved backlogs as they take unrated orders for Appendix D tools

MACHINE TOOL builders got a shot in the arm when National Production Authority amended Order M-41 to allow purchase of tools listed in Appendix D without rated orders. In the face of seriously declining backlogs of rated orders, the new amendment means that some manufacturers will not have to cut schedules as they had thought they might, but will continue to produce at normal rates.

Donald M. Pattison, director of NPA's Metalworking Equipment Division, says the relaxation of the order comes about as the result of prompt deliveries of such tools to the military and all others qualified for them. Also, NPA feels that the industry will be able to produce more tools more efficiently if it is allowed to accept and fill unrated orders.

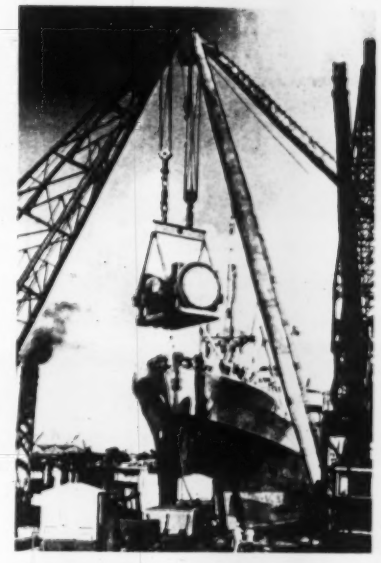
Just in Time—Many producers feel the action was just in time to avert at least a partial shutdown in the industry. Since January, 1951, shipments of all machine tools have risen from 114.3 per cent to an estimated 361.9 per cent of the base period of 1945-1947. At the same time new orders have declined from 475.4 per cent to about 254.9 per cent, according to the latest figures released by the National Machine Tool Builders Association.

Since July, 1952, the industry has reduced its service-rated backlog by two weeks per month until it now stands at an average of 6 months. That represents less than 30,000 tools.

Equals Lead Time — Combine those two sets of facts, and you get many situations where the manufacturer's rated backlog is equivalent to or less than his lead time. On the other hand, the backlogs of unrated orders for less critical tools have built up from about $110 million in August, 1952, to about $225 million in February, 1953.

The business is to be had, and the effect of the new amendment is to let toolmakers have it. The effect will be immediate, Mr. Pattison believes, although it will probably take at least 90 days for the effects to show up on the records.

Appendix D of M-41 includes boring machines, die-sinking machines, drilling machines, grinding machines, lathes, milling machines, planers and shapers.



Stator Shipped to India

Off the ship at Calcutta harbor comes a stator for a General Electric 62,500 kilowatt steam turbine-generator. The stator is destined for the ultra-modern Bokaro steam plant located 200 miles northwest of Calcutta on the Damodar river in India's mining country

Air Force To Sell 228 Tools

The Air Force Air Materiel Command is going to sell to the highest bidders 228 tools stored at Marietta, Ga., on Mar. 31. The units are the remainder of 40,000 tools stored shortly after World War II, most of which have been leased to Air Force contractors or to other branches of the services.

The tools are damaged, have missing parts or are obsolete for armed forces purposes. But they are repairable and may fit into some civilian production use. Highest bidders will obtain outright title to them.

Bids must be postmarked before midnight, Mar. 27, and sent to U. S. Air Force, Plant Clearance Office, c o The Tumpane Co. Inc., Government Aircraft Plant No. 6, Marietta, Ga. Forms may be obtained from that address. Prospective bidders may inspect the tools at Marietta.

CHECKLIST ON CONTROLS

Materials Orders

SELENIUM—NPA Order M-91 was revoked, effective Feb. 25, 1953, removing allocation control over selenium.

MACHINE TOOLS — Amendment of Feb. 27, 1953, of NPA Order M-41 no longer requires rated orders to obtain machine tools in Appendix D of the order. It was effective Mar. 1.

ALUMINUM SCRAP—NPA Order M-22 was revoked, effective Mar. 2, 1953, removing controls over aluminum scrap.

PLATINUM—Amendment of Mar. 3, 1953, of NPA Order M-54 permits a refiner to deliver to a processor platinum recovered from completed jewelry or parts of jewelry, or from scrap or sweepings, received from jewelry manufacturers, wholesalers and retail jewelers to be used by the processor in manufacturing any item included in List A of the order. The amendment was effective Mar. 3.

SILICON — Amendments of Mar. 4, 1953, of NPA Order M-80 and its Schedule 1 permit consumers of silicon to use or have in inventory up to 50 gross tons per month without reporting such usage to the NPA Iron & Steel Division. Previous limit was 15 gross tons per month. The amendments also exclude from inventory control boron, calcium and ferrosilicon. NPA Regulation 1 is amended accordingly. All amendments were effective Mar. 4.

NPA Regulations

SELENIUM—Amendment 2 of NPA Regulation 1, issued and effective Feb. 25, 1953, restricts users' inventories of selenium, selenium alloys and selenium dioxide to a 30-day supply.

SELENIUM—Amendment of Feb. 25, 1953, of Direction 3 to NPA Regulation 2 adds selenium and selenium alloys to the list of items for which defense (DO) ratings may not be applied or extended to obtain delivery.

Price Regulation

COPPER, ALUMINUM — Amendment 42 of General Overriding Regulation 9, issued and effective Feb. 25, 1953, exempts from price controls primary copper and aluminum; aluminum mill products; brass mill products; copper wire mill products; copper powder; copper and aluminum screen cloth; mechanical precision springs, metal stampings and screw machine products; bolts, nuts, screws and rivets; copper and aluminum ores and concentrates.

Appointments in Washington

Clifford L. Newton, superintendent of supplies and motor vehicles for the Southern Bell Telephone & Telegraph Co., Atlanta, was named director of the Communications Equipment Division, National Production Authority.

Robert C. Watson, formerly a senior member of the patent law firm of Watson, Cole, Grindle & Watson, was administered the oath of office as Commissioner of Patents.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

PREPARATION TOMORROW MAY BE TOO LATE
. . . a little planning might save a lot of trouble

Government and industry study means of diminishing damage of a possible bombing attack. Spokesmen stress importance of adequate preparation

IN THE INTEREST of industry is the new governmental study to minimize production interruptions from bomb attacks in event of war. It is titled the "Post-Attack Production Planning Program." W. J. Hoff, assistant to the director, Office of Defense Mobilization, heads the study.

Co-ordinator in the National Production Authority of efforts to interest industry in the program is James Hynes. So far two industries rubber and chemical manufacturing have taken hold, and others have become interested.

Manufacturers are accustomed to protecting themselves against risks such as fire, lightning, tornados, floods and there should be little difficulty in getting them to treat realistically the new risk of bomb attack. Adequate preparation is the important thing. In some cases dispersion can minimize the damage. By advance planning, reconstruction necessary to get bombed plants back into production can be expedited. In some of these activities, the manufacturer can meet the expense out of his own pocket.

That summarizes the program in a general way; specific measures will vary for different industries and for different plants in an industry. The approach is outlined in a pamphlet entitled "Suggested Post-Attack Production Measures." Manufacturers can get copies by writing to the Office of Defense Mobilization, Washington 25.

Commerce Face-Lifting? . . .

If Sinclair Weeks intends to make the Commerce department the advocate of private business in the federal government, he has a long way to go.

In this department are a group of agencies rendering informational and other services to industry. Another group, set up for defense programming, or assigned temporarily to carry out defense functions, include such agencies as the National Production Authority and National Bureau of Standards.

Commerce can advise but has no authority on vital problems facing industry. Functions important to business are vested with the Justice department and the Federal Trade Commission. Labor-management matters are the concern of the Labor department, National Labor Relations Board and the Federal Mediation and Conciliation Service.

If Mr. Weeks is to build up the Commerce department to be the effective voice and friend of business in the government, he will have to obtain powers now residing elsewhere.

Fortunately Mr. Weeks, in addition to being a forceful and successful businessman in his own right, is a member of an administration definitely pledged to the promotion of private business.

Maintains Watchdog . . .

The Senate Armed Services committee voted to continue "watchdog" operations of its Preparedness subcommittee. Chairman Leverett Saltonstall (Rep., Mass.), committee chairman, will head the subcommittee which will function in "task groups." The first task group, composed of Senators Styles Bridges (Rep., N. H.), Ralph Flanders (Rep., Vt.) and Harry Byrd (Dem., Va.) is investigating aircraft procurement.

Tax Reports in Offing . . .

Treasury department spokesmen told a news conference that the administration won't be able to submit its tax recommendations to Congress for two or three months. They refrain from guessing whether extension of the excess profits tax will be recommended.

Consider Seaway Project . . .

Sen. Alexander Wiley (Rep., Wis.) appointed a special Senate Foreign Relations subcommittee headed by himself to hold hearings on legislation to authorize American participation in the St. Lawrence seaway and power project.

Other members are Senators Robert Taft (Rep., O.), William F. Knowland (Rep., Calif.), John J. Sparkman (Dem., Ala.), Theodore Green (Dem., R. I.) and Walter F. George (Dem., Ga.). Hearings are tentatively scheduled to start about the middle of this month.

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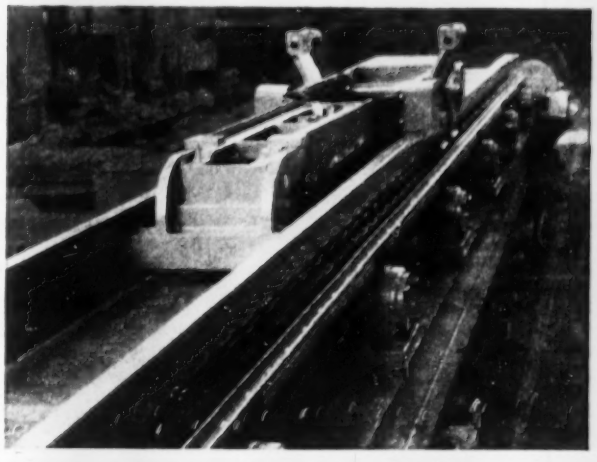

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British Problem Linked to Productivity

Latest statement on the British economic problem is the result of more than a year's study. Faster increase in productivity is seen as the key

PROTECTIVE AMERICAN tariffs and Buy American legislation were rapped again last week. This time it was in the findings of the Research & Policy Committee of the Committee for Economic Development.

Recommendations for American action in the CED report, "Britain's Economic Problem and Its Meaning for America," resemble those of Henry Ford II (STEEL, Feb. 23, p. 61): Reduce tariffs, simplify customs procedures, progressively remove agricultural import quotas and repeal the "Buy American Act."

First Served — "Increasing the output of the British economy, total and per capita, at a greater rate than in the inter-war period or than at present," was called the key to the British economic problem in the long run by the report. Acting on that problem, Great Britain became the first Mutual Security Program country to reach agreement on a $9 million allocation from MSP to be spent for the encouragement of productivity and stimulation of competition. Among other things, the MSP allocation will set up a revolving fund to provide short term reorganization and modernization loans to British manufacturers.

In the meantime, record iron and steel production in England, together with unsolved export problems, have brought about these unusual circumstances. Iron foundries are short of work, not through lack of pig iron but because of a lack of orders. The "ring fence," set up to keep out a strong flow of defense work, was removed from around Coventry, home of the British auto trade. The automobile industry has worked through its backlog in the last six months and British buyers can now get a new car right from the showroom.

New Marks—Steel production in Britain in January was at a weekly average of 346,300 tons, compared with the previous record of 345,200 tons in a week in November, 1952. Pig iron output was at a weekly rate of 213,900 tons, against the previous best rate of 208,000 tons a week in September, 1952.

The whole question of how far the U. S. should go to open its doors to foreign-made products and foreign trade is one of the first questions the Eisenhower administration will have to answer on a policy level. President Eisenhower, in his refusal to boost duties on imported briar pipes, promised action at "an early date." That would certainly be before the Reciprocal Trade Agreements Act expires on June 12, 1953. While generally considered in favor of low tariffs, the President has said any extension of the trade agreements legislation should include peril point and escape clause provisions.

U.S. Exports Hit New High

Final foreign trade figures for 1952 show U. S. exports hit $15.2 billion and imports rose to $10.7 billion. The export total is an all-time high and the import figure, while above the previous two years, is less than any other post-war year.

Ironically, military aid shipments, which were undertaken to help friendly nations survive the cleft with Communism, accounted for about $2 billion of the $4.5 billion excess in U. S. exports over U. S. imports. That unfavorable balance of dollar trade with the U. S. is weakening many foreign nation's position in the family of free western countries.

Instrument Market Ripe

"Most large producers of metals in Europe are anxious to modernize their plants and they have adequate funds to purchase new equipment," says Dr. M. F. Hasler, president of Applied Research Laboratories, Glendale, Calif. "That's in direct contrast to many U. S. and Canadian firms whose working capital has been stretched to the limit because of tremendous plant expansion and high taxes."

During his four month stay in Europe, Dr. Hasler completed arrangements for a new permanent ARL branch at Lausanne, Switzerland, to assemble and sell the company's scientific instruments.

Wisconsin Firm Assists Belgian Mill

Transmission of this diesel locomotive working in a Belgian steel mill is equipped with a 17.5 in. hydraulic coupling and CL-211 clutch manufactured by the Twin Disc Clutch Co., Racine, Wis. The clutch is actuated by a hand wheel instead of a lever. The locomotive is built by Moteurs MOES of Waremme, Belgium

TRADE ASSOCIATIONS

	All National Associations	Metalworking Associations*	Business Population
1910	250	50	2 million
1930	900	180	3 million
1953	1600	425	4 million

*Estimated by STEEL. Source for other figures: Department of Commerce

How To Grow With Them

STEEL FOUNDRYMEN wanted to find if there's a practical way to desulphurize their melt. The problem looked like it needed an expensive research job, one that no individual company in the industry could easily afford.

But the research job now being handled by Battelle Memorial Institute, Columbus, O., for $100,000 is well within the financial resources of the industry acting cooperatively through its trade association, Steel Founders' Society of America. F. Kermit Donaldson, executive vice president of the group, points out that results of the research, too costly for many members, will now be available to all through co-operation.

Keystone—A trade association helped make that possible. Trade associations are bringing countless benefits to industry yearly. They could do you still more service if you only used them better.

"All too frequently," says Orrin B. Werntz, executive secretary of National Screw Machine Products Association, "association members have only a partial idea of what their organization can do or is doing for them." Reuel W. Elton, the general manager of American Trade Association Executives, a trade association of executives in the association field, puts it this way: "Trade association men have a constant battle to get their members to use their services."

Definition — Trade associations are nonprofit organizations of business competitors in any single industry, formed to render mutual-aid services. As the accompanying chart illustrates, some 1600 such national groups are now in existence, an estimated 425 in metalworking alone which has more trade associations than any other industry in the U.S. Membership now approaches 1 million for national outfits of all types, 30,000 for metalworking groups. In a few of the larger groups, members have access to as many as 78 different kinds of services. In virtually all organizations, members can be helped by at least 15 basic services. And all that's available at a cost in dues which averages only 0.1 per cent of a company's annual sales.

The 15 major services probably offered by your association are listed in the accompanying table. C. J. Judkins, chief of the Commerce department's Trade Association Division, believes that the major benefit derived from trade associations is the pooling of know-how, as in the case of steel founders. Because of trade associations, manufacturers more readily today than a few decades ago reveal their operational secrets.

How It Works—"Manufacturers have learned that by helping each other they help themselves," says one association member. "For example, years ago a varnish manufacturer revealed through his trade association that he maintained a then-unusual degree of uniformity in his product by spitting into each batch and observing the action of the spittle. That led to investigation by the industry of a more scientific approach to the problem which eventually resulted in new laboratory methods of maintaining uniformity of quality methods that were made available to the whole industry."

Co-operative research is still a comparatively rare function among associations, but its use is growing and promises to be one of the most important functions in a few years. Besides Steel Founders' Society, American Petroleum Institute and American Gas Association are among the groups already active in that area.

Government Help—Co-operation through trade associations also pays off on government relations. Big companies may be able to hire Washington representatives to interpret the latest federal directives, but many small and medium sized firms can't afford that. But they can afford trade associations, and a major job for most of those groups since the start of World War II has been to render such service and fight in Washington for better treatment of their industries.

Are you taking full advantage of your opportunities in trade associations? The accompanying checklist can help you do a better job. The advice all boils down to this: To get full benefits, use your trade association, support it with your time, your money, your talents.

Tell Your Story—Especially important is to take your problems to your association. Your difficulty may not be as unusual as you think and the secretary may

What They Offer . . .

1. Information on business facts and problems.
2. Conventions and conferences where you can exchange know-how and meet competitors.
3. Help on government relations and legislative research.
4. Studies of trade practices, unfair competition and business ethics.
5. Public relations activities and building up of consumer good will.
6. Sales promotion of the industry's products.
7. Labor relations in general (but few regular trade associations go so far in employer-employee services as to be the industry's collective bargaining agency for employers).
8. Statistics and economic planning.
9. Commercial research to find wider and more profitable markets.
10. Industrial research to find new or improved products or manufacturing techniques.
11. Uniform cost accounting and industry surveys of costs of production and distribution.
12. Standardization, simplification, inspection, grading and certification.
13. Studies of the industry's financing, credit, collection, cash discount and related practices.
14. Commercial arbitration between members or between members and customers.
15. Furnishing advice on broad industry problems of a legal nature (but not acting as general legal adviser for industrial members).

What To Do . . .

1. Learn its functions.
2. Attend its national and regional meetings.
3. Get junior members of your company to participate in its special and regional meetings.
4. Read and study its many publications; assign one man the responsibility of knowing where and what the publications are.
5. Assign one man the responsibility of keeping up your company-association relations.
6. See that your company is well represented on your association's committees.
7. Be generous in your financial support. An association rarely has enough money.
8. If you aren't getting what you think you should from your association, let your association officials know it. They may be falling down on the job.

have already helped work out the solution for another company. For example, a metal fabricator was allowed only 6 per cent annually by the Bureau of Internal Revenue as a tax depreciation allowance. The company told its association about it; the association already had wrestled with that tax situation and had statistics showing that the industry's average depreciation allowance was 9 per cent, not 6. The fabricator won a 9 per cent allowance.

Or your association may have services you never knew it had. A basic metal producer was about to embark on a market research program to learn how to sell more efficiently to a big industry composed mostly of small companies. As a preliminary step, it joined the industry's association as an associate member and sent a man to attend the group's convention. There, the representative discovered that the association had complete industry statistics which fitted perfectly into the primary producer's market research plan. Instead of going to the expense of gathering the figures itself, it had access to statistics through the nominal expenditure of dues and the cost of sending a man to a convention.

Help for All—Or you may suggest a problem to your association that results in a new service for all. For example, diesel engine producers complained to their Diesel Engine Manufacturers Association about the shortage of good engineers and the lack of training of those college graduates they were getting. The result: The association outlined a program to educators whereby it would spend time and money to help get better engineers. There's still a shortage of engineers, but diesel manufacturers think they're on the road toward a solution. The same type of query on cost accounting led Malleable Founders' Society to publish a manual of principles and procedures for cost accounting which was one of the first of its kind.

George Eaton, executive secretary of National Tool & Die Manufacturers Association, believes many associations don't publicize their activities adequately. Few have the money to do the job. Money is a problem with practically all associations. They can't do what they know they should be doing. Some associations have staffs numbering more than 100, but the majority have only three of four full-time employees, not enough to do a good job.

Tragedy?—Such skimping could prove tragic, for as former President Hoover says: "Trade associations are the safeguards of small business and thus prevent the extinction of competition."

Trade associations got their start because of government encouragement. During World War I, Bernard Baruch as head of the War Industries Board urged companies to form mutual associations so he could better deal with them. Herbert Hoover, the co-father of the movement, developed the idea still further, when he was secretary of commerce in the 1920s, as the only practical way for government to deal with the then more than 3 million independent businesses in the U. S. That argument holds even greater weight today since more than 4 million separate businesses now function.

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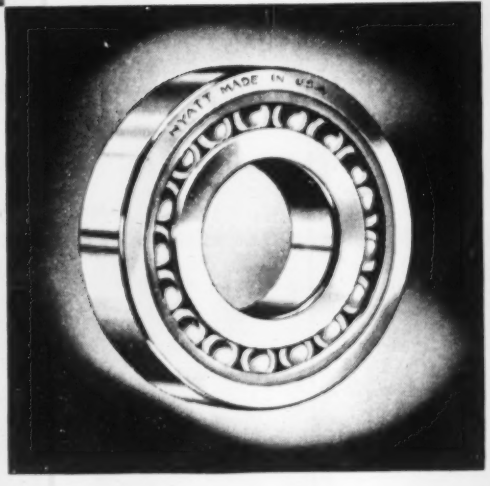

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HYATT ROLLER BEARINGS

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Corrosion continues No. 1 problem for automobile body engineers. Corners of bright work rust first because plating is thinnest there. One correction: Flatter trim and more wax

DETROIT

EVER NOTICE HOW rust starts first in the corners of your chrome car garnish? The explanation, if you didn't know, is because that's where the plating is thinnest. The vertex of an acute surface angle can get less than one-ninth of the one-thousandth inch nickel plate currently permitted car manufacturers, says D. M. Bigge, Chrysler Corp.

The moral noted by those attending the S.A.E. National Passenger Car, Body and Materials Meeting in Detroit last week is this: For designers—keep plated trim surfaces as nearly flat as possible; for car owners—keep those areas heavily waxed.

Splash, Rust—F. L. LaQue of International Nickel, noted that splashing water increases body corrosion two to four times over normal atmospheric corrosion. Surprisingly, salt treatment of roads accelerates corrosion only moderately. Mr. LaQue points out that more quickly disposing of snow through the use of salt may actually minimize corrosion when the greater natural melting time and consequent longer water splash is taken into consideration. "Wash your car frequently to get rid of the salt, however," says Mr. LaQue in conclusion.

A total copper and nickel plating thickness of .002 inches is necessary to provide adequate protection against corrosion for zinc, aluminum and magnesium base die castings, say M. R. Caldwell and C. Pack of Doehler-Jarvis Division of National Lead Co. They also point out that consideration of die life and intricacy of detail in the finished part desired should enter into the decision on material for die castings.

Headache for Engineers — Air conditioners are giving auto engineers their share of headaches. P. J. Kent of Chrysler predicts one out of every ten cars will be so equipped in the next decade. Whether they should be installed on the final assembly line or by dealers is a moot problem. H. V. Joyce of Ford points out that they are extremely complex to install and variations in drive ratio of the compressor to insure proper minimum and maximum operating speeds with variations in engine and rear end ratios of different models pose dealer installation barriers.

When installed, the system must be bled, filled with refrigerant and checked for leaks. The dealer removing radiator, radiator support, front end springs and shocks, tires, fan, crankshaft pulley, horns and other affected parts may not be eager to tackle this additional chore. In the last analysis, final assembly line installation looms more feasible, but automakers hate to loose the accessory nature of the cooler.

Bubble Trouble—Air bubbles and dirt accumulation in oil are the chief causes of hydraulic tappet trouble, says Carl Voorhies, Chicago Screw Co. They're troubles the engineers will have to lick because the modern overhead valve engine with high peak rpm accentuates the need for uniform valve timing over a greater range which hydraulic tappets afford.

Higher engine speeds also require design of valve gear components having a high stiffness to mass ratio, reports Ralph P. Horan, Eaton Mfg. Co. Overhead valve gear is much more sensitive to speed than L-head engines due to the greater weight and flexibility of parts.

Also advocated in valve design by John A. Newton and M. J. Tauschek of Thompson Products Inc., is the positive valve rotator to minimize the effects of valve seat distortion. The unit is reported to prevent occurrence of hot spots at any one point on the valve, prolonging valve life two to five times.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,830*	409,406
February		467,691
March		517,207
April		576,505
May		546,673
June		560,947
July		246,461
August		293,722
September		592,253
October		645,862
November		556,366
December		569,696
Total		5,989,121

Week Ended	1953	1952
Jan. 31	150,289	102,402
Feb. 7	146,809	102,406
Feb. 14	147,103	111,821
Feb. 21	161,860	110,542
Feb. 28	164,903	118,397
Mar. 7	162,000*	115,126

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Nash's Calculated Rambling

The only thing "rambling" about the new Nash Rambler is its name. These continentalized cuties are definitely aiming at an increased cut of the low-priced field through design away from the stigmatizing "small car" look.

Pinin Farina, Nash's favorite Italian dish, is served on the same 100-inch wheelbase. But fender lines have been lengthened and the hood has been lowered giving the body the look of being nine inches longer which it is. Add the continental spare tire mount which is standard on all models but the station wagon, and you have a car which will not look undernourished at anybody's drive-in.

This happy circumstance is precisely what the Nash people intended. With standard appointments including air conditioning system, radio, electric clock, courtesy lights, directional signals, foam cushions, custom upholstery and trim, continental rear tire mount and other deluxe features with no extras to buy, Nash figures it's offering a mightly competitive bit of merchandise to the Ford,

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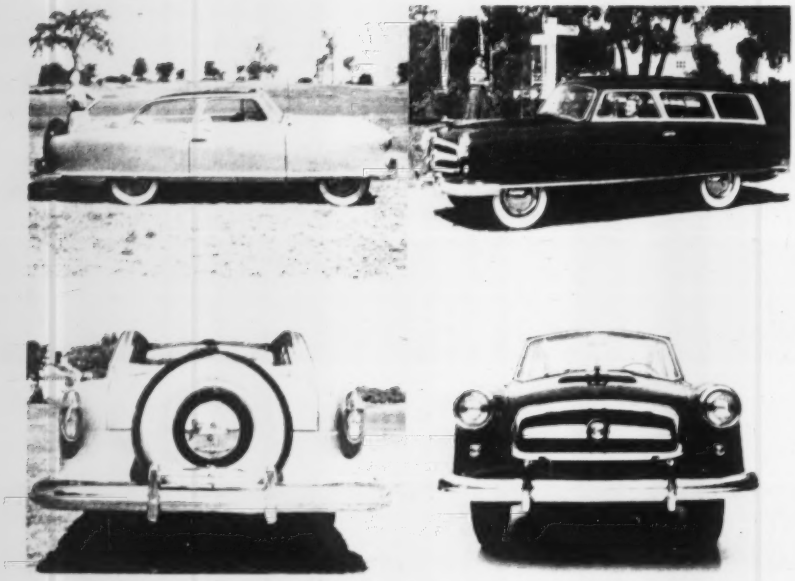

A Look at the 1953 Nash Rambler

Newly designed 1953 Nash Rambler series includes a custom convertible (upper left) and a station wagon (upper right). Continental rear tire mount (lower left) is standard equipment on Rambler convertible models, while the front end (lower right) shows a re-styled appearance with a lowered hood line and new air scoop

Chevrolet and Plymouth classes.

NXI To Become Reality — There's more to the Nash strategy than just the new Rambler, however. Remember the NXI that people who hang out in hotel lobbies were invited to opine on a few years ago? It's a small double-seater definitely in the economy car class, and it's going to be built. Austin will make the engine, Fisher-Ludlow will make the body and the whole deal will be assembled in England based on Nash specifications. Nash for its part will take a prearranged quantity of the demi-autos for stateside distribution.

The NXI in effect will become the Rambler in the future Nash line, with first shipments scheduled to arrive early in the fall. Meanwhile, the largerish Rambler will be rambling, Nash hopes, through the sales of the low-priced field.

Cleaning the Desk

Chevrolet has started production on the new R3350-85 turbo compound engines of 3500 horsepower at its Buffalo plant. Each engine contains 19,632 pieces exclusive of the carburetor which contains more than 600 alone. In all, 360 manufacturing plants in 20 states contribute to the Chevrolet aviation program.

Willys-Overland Motors Inc. expects to license Standard Motor Co. Ltd. of Coventry, England, to make the Willys jeep for sale in the sterling area. Cited in the move is penetration of the sterling area barrier which has existed since the end of the war for American manufacturers.

A merger in the "no comment" stages is pending between Willys-Overland and Kaiser-Frazer. Before this column sees print the merger may be concluded. Kaiser production thus far this year is 7000 compared with 9300 for the first two months of 1952. Willys production ran about 10,000 during the first two months of 1953 compared with about 5000 during the like period in 1952. A co-operation of the manufacturers in which Willys supplies the Henry J chassis and engine has been in effect since the Henry J was created. In further union, the reasoning may go, lies strength.

Reconstruction Finance Corp., eyeing the multi-million dollar Kaiser-Frazer bag it could possibly be holding undoubtedly agrees.

Reo Motors Inc., reports that: More than 12,000 gallons of gasoline are consumed each month in its dynamometer department in testing truck engines; sales of used trucks at Reo branches throughout the country have increased 21 per cent over last year; a "combination" muffler has been developed as part of an independent program aimed at reducing truck noise.

Chrysler Corp. reveals that 68,000 DeSoto and Chrysler cars have been ordered with power steering during the past six months, almost as many as in the entire preceding year.

Jaguar Goes Automatic

If you've been troubled by pesky gear shifting on your Jaguar sedan, here's good news: Jaguars will have a Borg-Warner automatic transmission as optional equipment henceforth.

Manufactured by Detroit Gear Division of Borg-Warner Corp., the units will be shipped to England for assembly into cars. The cars, in turn, will probably be shipped right back to the United States.

Involved in the unit are a hydraulic torque converter and two sets of planetary gears constantly in mesh in series. The planetary gears provide two forward driving ratios and a reverse ratio, all sans clutch. Results are claimed to be equivalent of the four-speed transmission now standard on Jaguar cars permitting the use of high ratios in the rear axle. In direct drive, the converter is locked out preventing heat loss, with downshifting through accelerator depression at speeds up to 66 miles an hour.

Two years of rigorous testing in the Swiss Alps lend substantial evidence to the belief that the transmission is ready for the market. Besides, it's starkly similar to the transmission Borg-Warner has been making for Studebaker.

Jaguar expects the transmission to double sales of its Mark VII sedans in the United States, but the unit will not be immediately available for the XK-120, most popular of the Jaguar line in this country. About 8000 Jags are currently in American garages.

Cost of the unit, if you're wondering, will be about $280; car somewhat additional.

Search and Research

● The "third degree" is but a superficial scanning compared to the trials a ball bearing must withstand in New Departure's Research Laboratory. Here, under conditions which pack years of normal use into a short time, engineers determine how to make the best ball bearings even better.

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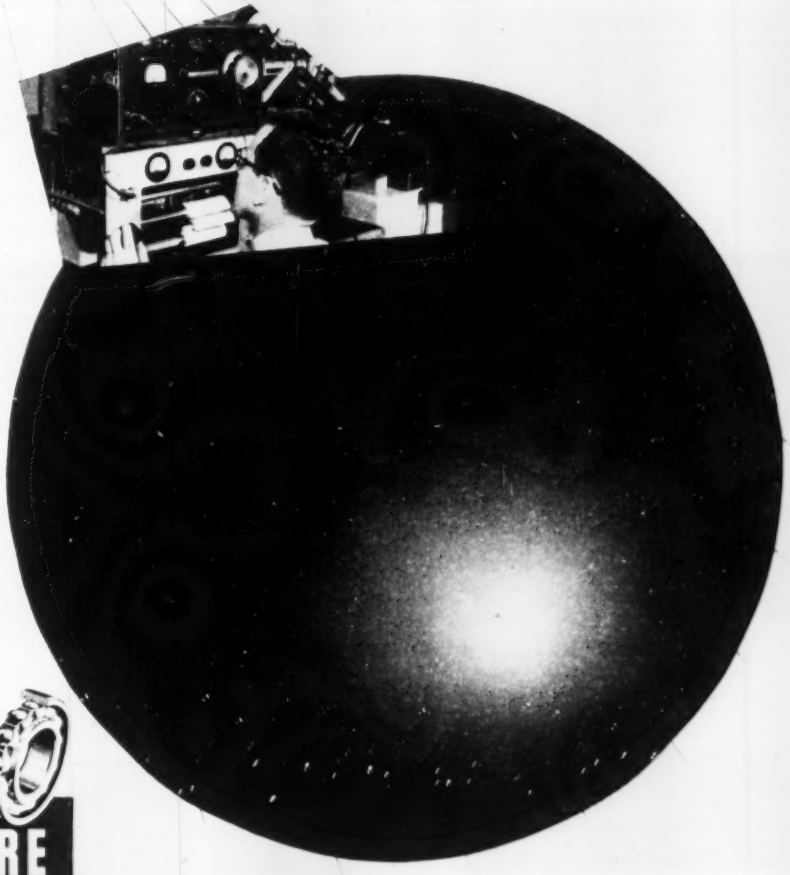

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BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Also Makers of the Famous New Departure Coaster Brake

=ORDER FOR 52100 TUBING RECEIVED TODAY.

WILL BE SHIPPED FROM MILL STOCK TOMORROW=

ORDER wear-resistant 52100 tubing today. We ship it tomorrow from our mill stock of one hundred and one sizes!

A high-carbon chrome steel, 52100 manufactured by the Timken Company, is through-hardening in moderate sections and can often be used in place of more expensive steels.

It can be heat treated to file hardness and tempered back to any desired point. And it's available in sizes from 1" to 10½" O.D., to fill many of your hollow parts needs: aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instrument parts.

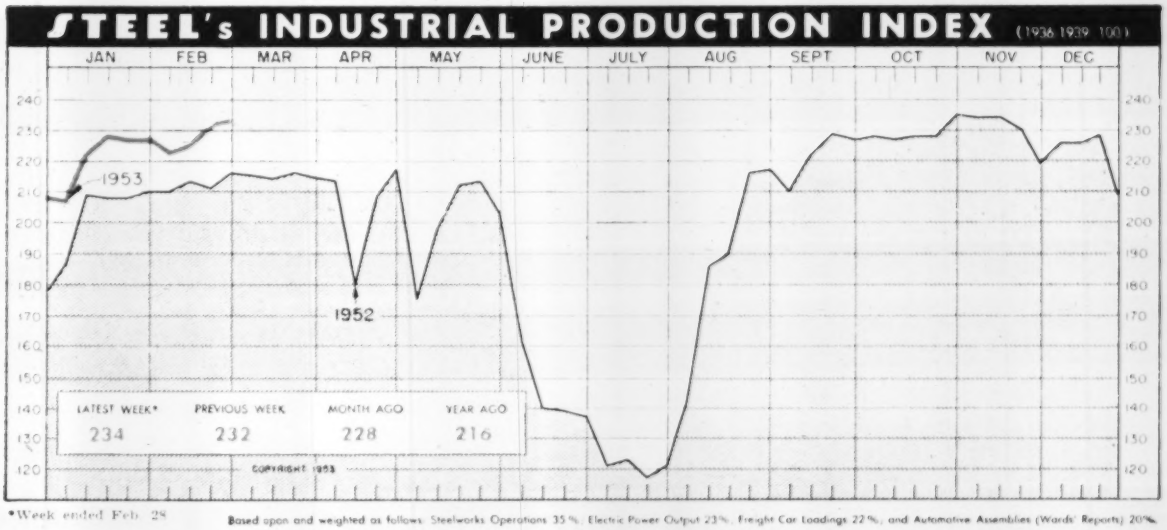
As America's first producer of 52100 tubing, the Timken Company has unequalled experience that results in uniform high quality from tube to tube and order to order. Rigid quality control checks every step of production.

For immediate delivery of your less-than-mill-quantity orders, write, wire or call The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend



*Week ended Feb. 28

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Production is staging another upswing as soaring automotive operations supply the largest boost. Industrial activity index nears the record level attained last fall

BUSINESS activity is staging another upswing and may set new records in the weeks to come.

Production in mid-February halted its sidewise movement and started to climb rapidly. In the two weeks ended Feb. 28, STEEL's industrial activity index rose 8 percentage points to 234 per cent of the 1936-1939 average. This index reading is only 1 point below the record of 235 per cent set in the final week in October, 1952.

Most prime indicators of the nation's output are advancing rapidly, indicating that the hoped-for spring upturn in industrial activity is probably under way.

High Demand—Automotive companies receiving a shot-in-the-arm by the lifting of production quotas boosted the U. S. output of passenger cars and trucks in the final week in February to the highest level in 21 months. This new level may be maintained in the weeks ahead as the industry tries to reach its production goals for passenger vehicles and trucks.

Electricity production, a good barometer of industrial activity, is also climbing. Generation in mid-January remained about 7 per cent over the comparable weeks in 1952. At present, utilities are producing nearly 10 per cent more electricity than a year ago.

Steady Progress—Steel production is also making steady, though less spectacular, progress. Mills in the first six weeks of 1953 were operating at around 99 per cent of the Jan. 1, 1953, rated capacity. In the two weeks ended Feb. 28, steel operations rose to 100.5 per cent of capacity.

Freight car loadings, on the other hand, are continuing to lag about 4 per cent under shipments in the comparable weeks of 1952. Most of this decline, however, is due to the drop-off in shipments of agricultural products and livestock.

Steel Output Nears Record . . .

Steel mills, with demand coming from all consuming directions, are doing practically everything to maintain production as high as possible. The American Iron & Steel Institute estimates that production in the week ended Mar. 7 totaled 2,224,000 net tons of steel for ingots and castings. This output is within 4000 tons of the record 2,248,000 net tons poured in the week ended Feb. 9, this year.

Forging Shops Busy . . .

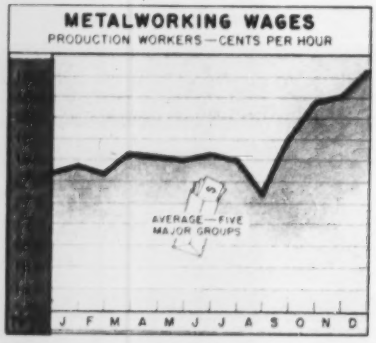
Makers of forgings are pounding out high production, which, in turn, is lowering the industry's unfilled orders. The Census bureau says that shipments of steel forgings in December rose 16 per cent over November to 181,000 net tons. Drop and upset forgings accounted for 134,000 tons of the December total, while press and open hammer forgings accounted for the balance of 47,000 net tons.

Unfilled orders for commercial steel forgings on Jan. 1 approximated 1.2 million net tons, or 190,000 tons below the level of the previous three months.

Autos Rolling Fast . . .

The passenger auto industry, hoping to complete 3.2 million units in the first half of 1953, is pulling the throttle out on production. U. S. assembly lines in the week ended Feb. 28 yielded a bumper crop of 126,671 passenger vehicles, or 47 per cent over the comparable week in 1952, says *Ward's Automotive Reports*. These end-of-the-month completions brought the February total to around 483,000 units, up 17,000 units from January.

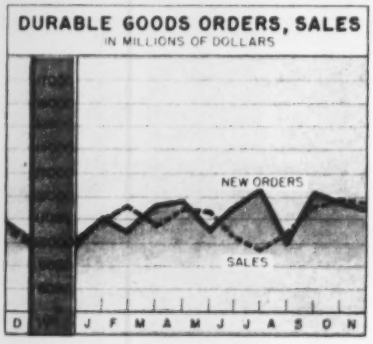
Truck production, however, is making a disappointing showing



Metalworking Wages
(cents)
Production Workers—Five Major Groups

	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
1951					
Dec.	183.6	170.6	181.7	167.0	190.3
1952					
Jan.	184.7	170.3	182.9	166.9	191.4
Feb.	183.1	170.5	183.0	166.8	190.3
Mar.	184.8	171.5	184.1	169.5	193.4
Apr.	183.0	170.9	183.6	169.5	192.0
May	184.0	171.5	184.0	169.5	192.4
June	183.0	171.5	184.7	170.4	194.0
July	181.3	170.0	184.4	169.5	194.0
Aug.	193.7	172.4	184.5	171.6	194.8
Sept.	199.1	176.3	187.1	173.6	200.5
Oct.	199.0	178.9	188.5	173.0	202.7
Nov.	200.0	179.4	190.1	173.2	204.3
Dec.	202.4	181.0	191.6	173.9	206.0

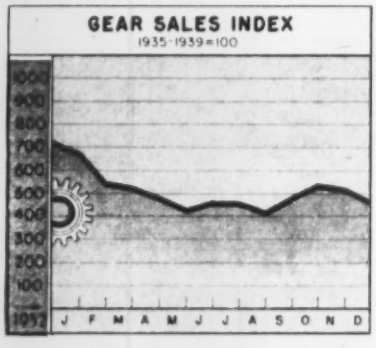
U. S. Bureau of Labor Statistics



Durable Goods Orders, Sales
In Millions of Dollars

	New Orders*		Sales	
	1952	1951	1952	1951
Jan.	11,115	15,050	10,459	10,430
Feb.	11,592	13,474	10,694	10,200
Mar.	11,841	15,452	11,270	10,851
Apr.	12,761	12,987	11,237	10,739
May	11,492	15,542	11,056	10,851
June	12,423	13,257	10,284	10,383
July	11,393	12,235	8,844	9,666
Aug.	9,938	11,032	10,579	10,028
Sept.	12,198	10,344	11,905	9,508
Oct.	11,772	11,956	12,787	10,660
Nov.	11,390	11,820	11,529	10,542
Dec.		10,937		9,963

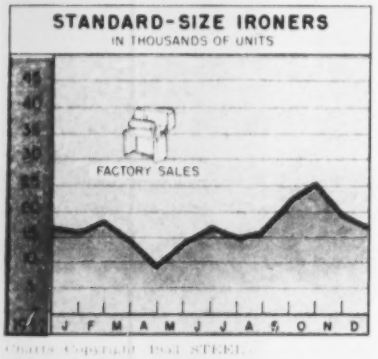
*Seasonally adjusted U.S. Office of ... Economics



Gear Sales Index
(1935-1939 = 100)

	1952	1951	1950
Jan.	670.6	764.6	280.2
Feb.	539.5	809.1	272.5
Mar.	547.1	830.7	358.4
Apr.	478.7	742.5	328.6
May	425.9	667.1	363.1
June	452.3	800.9	401.0
July	453.9	588.1	410.7
Aug.	413.9	564.2	617.4
Sept.	485.0	630.1	654.5
Oct.	533.1	703.4	564.8
Nov.	516.0	630.0	551.9
Dec.	466.8	716.5	650.1

American Gear Mfrs. Assn.



Standard Size Ironers
Factory Sales, Units

	1952	1951	1950
Jan.	15,636	24,600	20,300
Feb.	17,630	32,400	21,600
Mar.	13,913	34,700	37,800
Apr.	8,938	23,700	31,600
May	12,652	24,200	27,400
June	17,654	24,500	27,100
July	15,026	11,100	24,100
Aug.	16,177	17,200	42,700
Sept.	22,492	18,300	41,400
Oct.	25,204	29,800	47,500
Nov.	19,724	20,500	41,900
Dec.	16,708	16,900	38,800
Total	202,143	277,700	406,200

American Home Laundry Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 25	Indus. Production	Feb. 16	Ranges, Gas	Feb. 25
Employ., Metalwkg.	Jan. 28	Machine Tools	Feb. 9	Refrigerators	Feb. 2
Employ., Steel	Dec. 15	Malleable Castings	Mar. 2	Steel Castings	Mar. 2
Fab. Struc. Steel	Feb. 9	Prices, Consumer	Jan. 26	Steel Forgings	Mar. 2
Foundry Equip.	Feb. 16	Prices, Wholesale	Jan. 26	Steel Shipments	Nov. 3
Freight Cars	Feb. 16	Pumps	Feb. 16	Vacuum Cleaners	Feb. 9
Furnaces, Indus.	Feb. 2	Radio, TV	Feb. 2	Washers	Feb. 25
Gray Iron Castings	Mar. 2	Ranges, Elec.	Feb. 2	Water Heaters	Feb. 25

when compared to passenger autos. In the week ended Feb. 28, manufacturers in the U. S. rolled out 28,024 trucks. During 1952, the fourth quarter netted several 30,000-unit output weeks, while in March, 1951, operations soared as high as 35,000 trucks per week. Yet truck output is expected to rise in the next few weeks, since virtually all change-overs to new models have been completed.

Combined U. S. and Canadian auto-truck output in the week ended Feb. 28 totaled 164,903 units, up more than 3000 units from the previous week and far over the 118,397 passenger cars and trucks produced in the comparable week in 1952.

Business Outlook Good . . .

Business will probably remain at today's high levels at least through June. That's the consensus of industrial buyers polled by the Business Survey Committee of the National Association of Purchasing Agents.

Production in February rose above the current demand and started to eat into order backlogs. New orders in February continued to flow in, though slightly under the January rate. Much of the new business was in orders for early delivery.

Employment in February remained about the same as in the previous month, although a few companies reported longer workweeks. Skilled labor remained in short supply. Wage decontrol didn't cause much labor unrest during February, but many labor-management discussions were in process.

Laundry Equipment Jumps . . .

While practically all appliance makers are saying that demand is good, the laundry is gaining precedence over the kitchen in the uptrend. A report of the Gas Appliance Manufacturers Association says that shipments of domestic gas ranges in January rose to 166,900 units, only 0.5 per cent over January, 1952. But the market is far less saturated in laundry equipment. The American Home Laundry Association reports that factory sales of standard-size household washers in January totaled

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.5	100.5	101.0
Electric Power Distributed (million kwhr)	8,190[3]	8,196	7,416
Bituminous Coal Output (daily av.—1000 tons)	1,421	1,392	1,702
Petroleum Production (daily av.—1000 bbl)	6,540[3]	6,543	6,367
Construction Volume (ENR—millions)	$322.7	$144.1	$165.7
Automobile, Truck Output (Ward's—units)	164,903	161,860	118,397
TRADE			
Freight Car Loadings (unit—1000 cars)	700[3]	690	756
Business Failures (Dun & Bradstreet, number)	178	176	163
Currency in Circulation (millions)[4]	$29,735	$29,654	$28,390
Dept. Store Sales (changes from year ago)[5]	+ 2%	+ 3%	+ 13%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$14,264	$17,520	$14,767
Federal Gross Debt (billions)	$267.5	$267.4	$260.3
Bond Volume, NYSE (millions)	$14.5	$16.6	$11.0
Stocks Sales, NYSE (thousands of shares)	8,968	6,630	6,158
Loans and Investments (billions)[4]	$77.1	$76.9	$73.5
United States Gov't. Obligations Held (billions)[4]	$31.1	$31.3	$32.0
PRICES			
STEEL's Weighted Finished Steel Price Index[3]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	210.9	210.7	243.6
All Commodities[7]	109.7	109.6	113.0
All Commodities Other Than Farm and Foods[7]	113.1	112.8	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,010. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

277,309 units, a gain of 29.6 per cent from a year earlier. Sales of automatic tumbler dryers in January reached 38 per cent over January, 1951, to 62,260 units. Ironer sales took the biggest over-the-year jump (45 per cent) in January by aggregating 24,395 units.

Structurals Tower Skyward . . .

As the construction boom rolls on, new orders for structural steel are also gaining momentum. The American Institute of Steel Construction says that January bookings for fabricated structural steel amounted to 268,163 tons, an increase of 14 per cent over December and 26 per cent over January, 1952. Shipments of structurals in January totaled 234,234 tons, or some 33,929 tons under the incoming orders of that month.

Total industry backlog on Feb. 1 amounted to 2,179,777 tons, of which 49 per cent is scheduled to be produced before May 31.

Retail Sales Improve . . .

Sales of retail stores are up considerably from a year ago, when the bottom had fallen out of the post-Korea spending spree. The Commerce department's Office of Business Economics says that sales of retail stores in January totaled $13 billion, about 10 per cent over January, 1952. Sales of durables rose 11 per cent over the year to $4.3 billion.

Consumer Prices Edge Down . . .

The cost of living in January declined for the third consecutive month. So says the Bureau of Labor Statistics, as it introduced its controversial index of consumer prices. Retail prices of goods and services bought in January by moderate-income urban families average 0.2 per cent lower than those of December and 0.4 per cent under those of November. The bureau's index in January was 113.9 per cent of the 1947-1949 average, compared with 113.1 in January, 1952.

Trends Fore and Aft . . .

The Federal Reserve Board's index of industrial production in January rose 2 points to 237 per cent of the 1935-1939 average. . . Shipments of plumbing fixtures in the fourth quarter of 1952 rose 9 per cent over the same period in 1951. . . Business failures in 1953 are averaging 8 per cent over the same period, a year ago. . . Contract awards for heavy construction in 1953 are about 46 per cent over the same weeks in 1952.

. . . of scrap strip

Quickly. . .

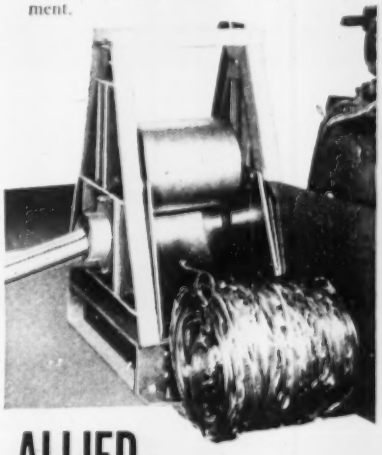
with an Allied Scrap Baler

. . . simple, inexpensive, electrically operated. Forms densely packed bundles 19" x 19", about 400 lbs. Wound up in a few minutes. Needs only one man.

Sell Bundles of Steel

Profitably. . .

. . . saves time, clears floor areas. A profitable means for quick salvaging right at shearing operations. Produces compact, saleable bundles ready for shipment.



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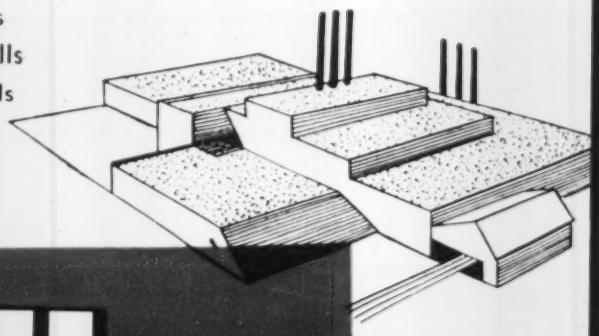
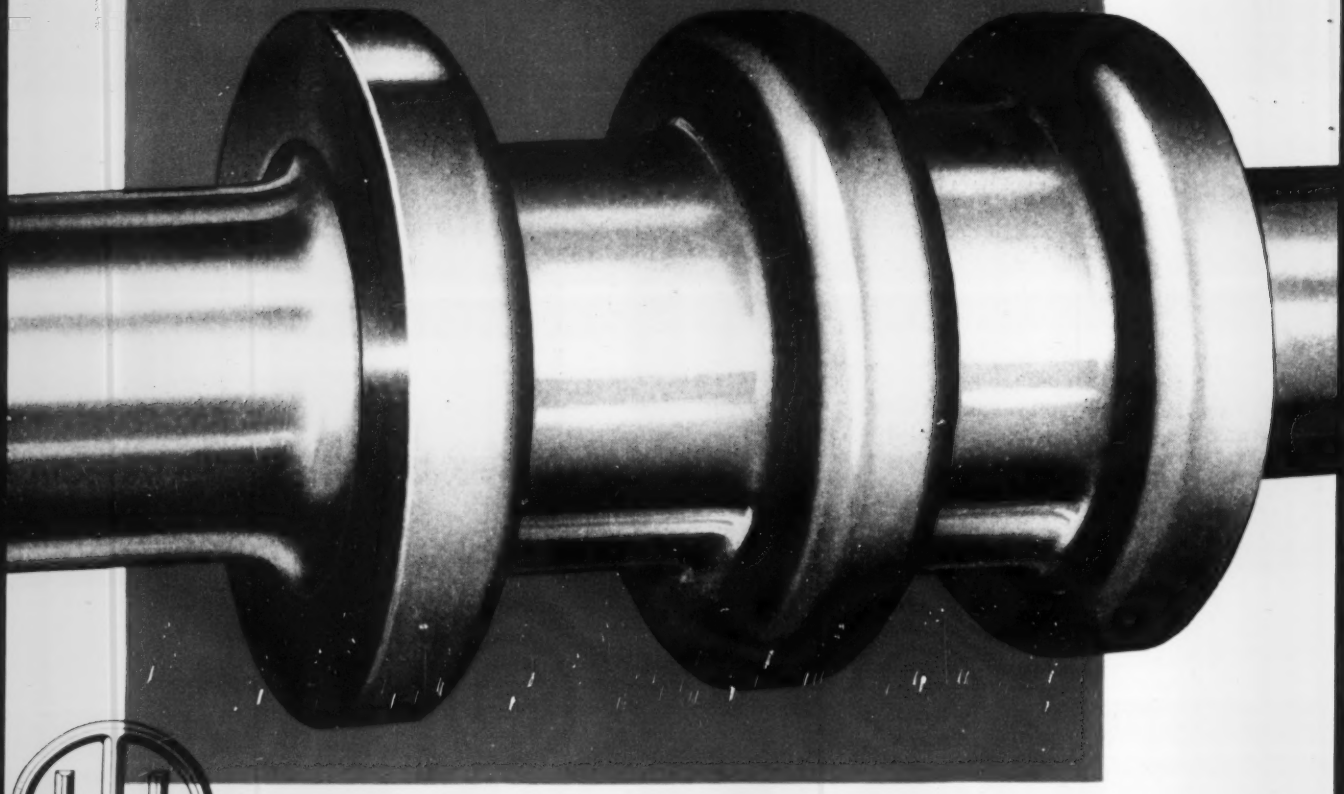


Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

ROBERT C. TRUNDLE
. . . president of Trundle Engineering

F. J. KOEGLER
. . . new duties at National Lead

HARVEY R. HILLER
. . . Laclede-Christy gen. sales mgr.

Robert C. Trundle was elected president, **Trundle Engineering Co.**, Cleveland, to succeed **George T. Trundle Jr.**, elected chairman of the board, continuing in active charge of major policies. Added to the board of directors are **C. P. Hawkins** and **Lyman B. King**, both vice presidents.

Richard A. Williams was appointed director of engineering, **Comfort Products Corp.**, Dallas. He will be in charge of both design and research. Mr. Williams was for many years chief engineer with Yates-American Machine Co.

Responsibilities of **L. A. Dixon, Rockwell Mfg. Co.** executive vice president, have been expanded to include jurisdiction over the company's power tool operation, which includes the Delta Power Tool Division, Rockwell Tools Inc. and De-Luxe Saw & Tool Co. He is located at Pittsburgh.

Standard Horse Nail Corp., New Brighton, Pa., appointed **F. S. Merrick** vice president; **W. C. Sheers** manager, production and quality control; **H. K. Anderson** supervisor of customer service.

Thermal Transfer Corp., Pittsburgh, appointed **Joseph V. Schleisner** chief engineer and **Robert J. Sahr** sales engineer.

National Lead Co., New York, elected **F. J. Koegler** a vice president of the company and general manager of its newly formed Doehler-Jarvis Division. He started with Doehler-Jarvis Corp. in 1913, became a vice president in 1933, executive vice president in 1948 and president in January of last year. He makes his headquarters in Toledo, O.

Lloyd R. Wallis, secretary-treasurer, **Youngstown Foundry & Machine Co.**, Youngstown, was elected vice president and treasurer. **L. R. Massman** was named secretary and **B. S. Parker** was elected vice president and general manager. **J. Harry Reed** becomes manager of sales.

Pipe Machinery Co., Cleveland, appointed **Russel L. Gergen** sales manager, gage division. He has served the company in various capacities for 12 years.

Henry F. Arndt of the **Detroit Electric Furnace Division**, Kuhlman Electric Co., Bay City, Mich., was named chief engineer of the division to replace **Charles V. Kilburn**, who resigned to join Essex Wire Corp.

John R. German was appointed purchasing agent of **Shelley Steel Corp.**, Chicago. He had been with Inland Steel Co. for 25 years.

Harvey R. Hiller replaces **John L. Cummings**, resigned, as general sales manager, **Laclede-Christy Co.**, St Louis. Mr Hiller joined the company 30 years ago as a sales engineer, was subsequently named district sales manager, regional sales manager and assistant vice president of sales.

Kilbourne Knox Jr., for the last five years senior designer on hydraulic equipment with McDonnell Aircraft Corp., joined **Parker Appliance Co.**, Cleveland, as staff engineer in charge of engineering aircraft hydraulic equipment. **Edward W. Hollis** is manager of the new Cleveland sales office, while **Donald T. Boody** will head the new Los Angeles office in the plant of Parker Aircraft Co. **George A. Fort** was promoted from manager of quality control to general manager, rubber division, succeeding Mr. Hollis.

William F. Langefeld, director of purchases, Material Service Corp., joins **Maytag Co.**, Newton, Iowa, in a similar position. He succeeds **C. W. Clauser**, appointed personal assistant to the vice president of manufacturing.

Lincoln Engineering Co., St. Louis, appointed **T. V. Picraux** production manager for both its plants. **Albert J. Gruenewald** was made sales manager, industrial division, to re-

J. H. WERNER

J. L. KOZMA

VERNON L. MILLER

R. L. CORBETT

. . . newly appointed district managers at Lee Wilson Engineering

place Mr. Pieraux, and **Robert E. Redenbaugh** manager of its original equipment division.

New district managers for **Lee Wilson Engineering Co. Inc.**, Cleveland, are **J. H. Werner**, southern and midwestern territory, operating out of Chicago; **J. L. Kozma**, centrally located in his territory at Pittsburgh; and **R. L. Corbett** who continues coverage of Ohio from the Cleveland office. **Vernon L. Miller**, formerly chief engineer, was made district manager for the eastern territory with headquarters in the New Haven, Conn., area.

Lee Johnson was made assistant manager of service, **Chicago Vitreous Enamel Products Co.**, Cicero, Ill. He succeeds **John McLaughlin** who now devotes full time to special projects.

District sales offices created by **Jones & Laughlin Steel Corp.** are managed by **E. W. Hoster Jr.** at Columbus, O., and **F. A. Haynes** at Louisville.

Firth Sterling Inc. appointed **John P. Sweeney** Detroit district manager and **Munro J. Mann** as assistant district manager. Mr. Sweeney succeeds **Gunther A. Jacobs.**

Sales representatives named to serve **Electro Refractories & Abrasives Corp.** include **John E. Courtney** at Detroit; **Charles W. Anthony**, central Ohio; **Sterling Muck**, Pittsburgh; **Peter Antonez**, New England; and **Robert C. Hebard**, Buffalo. Other changes include transfer of **Frank L. Doerr Jr.** from Detroit to Cleveland as grinding wheel sales engineer, and **William J. Eames** to Chicago.

Victory Steel Supply Co., Milwaukee, elected **H. A. Zartner** vice president in charge of estimating and engineering, and **David Becker** second vice president and general works superintendent.

Dr. Allen S. Russell replaces **Cyril S. Taylor**, retired, as chief, physical chemistry division, Aluminum Research Laboratories, New Kensington, Pa., **Aluminum Co. of America.**

Walter A. Madej was promoted to the newly created position of superintendent of the Utica, N. Y., plant, **Chicago Pneumatic Tool Co.**

A. L. Danielson succeeds **G. M. Wallace** as branch manager, Denver office, **Bailey Meter Co.** Mr. Wallace was recently appointed an assistant sales manager at Cleveland.

Curtis L. Bates joined **Ryan Aeronautical Co.**, San Diego, Calif., as assistant director of engineering. For the last ten years he has been with Northrop Aircraft Inc.

Lloyd W. Wendell was named executive vice president, **Federal Steel Warehouse Corp.**, Dayton, O.

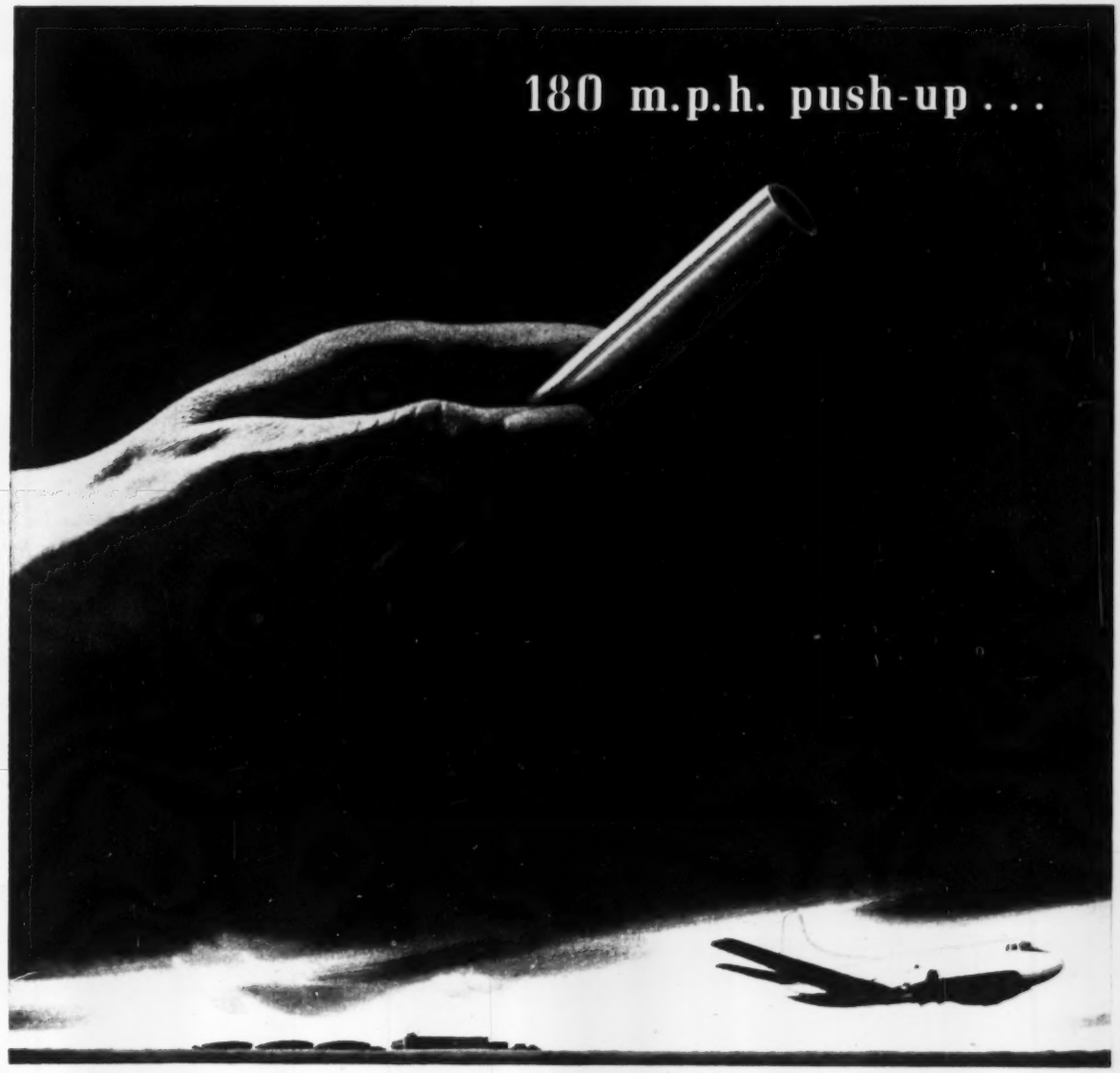
Clarence C. Walters was appointed assistant chief engineer, **Republic Steel Corp.**, Cleveland.

Joseph E. Berman was elected president and chairman of **Industrial Metal Protectives Inc.**, Dayton, O., succeeding **H. A. Toulmin Jr.**, who sold his interest in the firm.

Geco Inc., Cleveland, an affiliate of General Engineering Co., appointed **M. E. Hackstedde** manager of its production heat division. He was sales engineer for the Tocco Division, Ohio Crankshaft Co.

Donald R. Moffat is district manager of the recently opened Cincinnati office, **Virginia Metal Products Corp.**

Flexible Co., Loudonville, O., ap-



Any time you fly in a Martin 4-0-4, Superior tubing is probably working for your safety.

Once you're airborne, watch the 840-pound main landing gear assemblies flip forward and up with amazing speed, even though they may be working against a 180 m.p.h. drag. Fast landing gear retraction gives you an extra margin of take-off safety because "clean" aircraft have better flight characteristics.

Chances are your Martin 4-0-4 contains many feet of Superior ½" stainless steel tubing. In the hydraulic system, this tubing operates at a pressure of 3000 p.s.i., normally. On Martin's torture racks, it has demonstrated remarkable endurance under violent pressure surges at 1000 cycles *per second*, even around minimum bends.

Performance like this may well have a bearing on your production problems as well as on your personal safety. Superior's long experience in fine tubing, backed by highly-developed production equipment and extensive research and testing facilities assures you of top-quality small tubing for doing tough jobs well. Outline your own production problems in a letter to us, right now—we'll send you complete information and the appropriate Data Memo by return mail. Address: Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys and Beryllium Copper.

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West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331

All analyses .010" to ⅜" O.D.
Certain analyses (.035" Max. wall) up to 1⅜" O.D.

CHESTER A. SIVER
. . . joins Black, Sivalls & Bryson

E. O. BURGHAM
. . . gen. supt. at Weirton Steel

JOHN D. SMALL
. . . V. P., Pressed Steel Car Co.

pointed **J. F. Gettrust** western sales manager, and **Harold E. Hilty** eastern sales manager.

Black, Sivalls & Bryson Inc., Kansas City, Mo., appointed **Chester A. Siver** as general manager of engineering. Before joining the company he was manager of engineering, Liquid Carbonic Corp., durable goods division, and previously was associated with American Machine & Foundry Co. and Linde Air Products Co.

John L. Cummings joins **Davis Fire Brick Co.**, Oak Hill, O., as vice president and sales director. He formerly was general sales manager of Laclede-Christy Co.

G. A. Tamblyn was made sales manager of **Frank G. Hough Co.**, Libertyville, Ill. With the company 11 years, he has been assistant sales manager since 1948.

Following resignation of **J. Stewart Williamson** as vice president in charge of operations of **Weirton Steel Co.**, Wierton, W. Va., **E. O. Burgham** was promoted from general superintendent to vice president. Other promotions include **J. H. Strassburger** to assistant vice president assigned to the engineering department in charge of research and development; **Alfred E. Kadell** from manager, tin mill, to general superintendent; **Glenn Gould** as tin mill manager and **Arch Miller** as assistant manager. Mr. Williams, who finishes 35 years of service with the company, continues in a consulting capacity.

Promotions at **Benjamin Wolff & Co.**, Chicago metal distributor, include **Duane S. Seavey** as Chicago district sales manager and **Herbert F. Peterson** as manager of aluminum product sales.

John D. Small was elected vice president, **Pressed Steel Car Co. Inc.**, New York. From November, 1950, until last year he served as chairman of the Munitions Board, U. S. Department of Defense. Previous to that he was an executive with Emerson Radio & Phonograph Co.

Carleton P. Adams was appointed advertising manager and **Newcombe C. Baker Jr.** as manager, special sales promotion of Yale Materials Handling Division, **Yale & Towne Mfg. Co.**, Philadelphia. Mr. Adams was formerly with Quaker Rubber Corp. as director of advertising and sales promotion.

Merritt S. Stevenson was made manager of transportation sales for **Baker-Raulang Co.**, Cleveland.

Wallace A. Gray has become a

Please turn to Page 140

OBITUARIES . . .

E. P. Langworthy, 65, president, **Bearium Metals Corp.**, Rochester, N. Y., died recently in Florida.

Benjamin H. Howell, 77, president and founder of **Garfield Mfg. Co.**, Garfield, N. J., died Mar. 1.

Anton P. Rabas, 65, president, **Niagara Metal Works Inc.**, Buffalo, died Feb. 16.

Rudolph J. Thurner, 74, founder and president, **Thurner Heat Treating Co.**, Milwaukee, died Feb. 22.

Irving R. Smith, 69, president, **Sterling Wheelbarrow Co.**, West Allis, Wis., Lawran Foundry Co. and affiliated firm, Sterling Foundries Specialties Ltd., died Feb. 26. He was also a director of Safway Steel Scaffolding Co. and Smith Engineering Works, both in Milwaukee.

Harry A. Ball, retired steel drum manufacturer, who established **H. A. Ball & Sons**, died Feb. 22.

James I. Minteer, 51, secretary, **Stewart-Warner Corp.**, Chicago, died Feb. 24 of a heart attack.

Harold F. Ziegler, 52, president, **Tanktainer Welded Products Inc.**, Gary, Ind., died Feb. 22.

Theodore B. Drescher, 58, a vice president, **Bausch & Lomb Optical Co.**, Rochester, N. Y., died Feb. 22.

W. Raymond Steele, secretary, **E. D. Clapp Mfg. Co.**, Auburn, N. Y., died Feb. 16.

John M. Lepo, 46, Chicago sales manager for **McLouth Steel Corp.**, died Feb. 25.

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Guessing games can be lots of fun. But not to our engineers and metallurgists. They take a dim view of guesswork of any kind—particularly when it comes to making wire.

Steel for Wickwire Wire comes from our own blast furnaces and open hearths, is made exclusively for wire and wire products; precision drawn and processed in our own modern wire mills.

That way, our engineers and metallurgists maintain constant and careful control over the quality of Wickwire Wire. That way, through precision testing and inspection, they *know for sure* that the Wickwire Wire you buy is always of unvarying uniformity in size, surface, tensile strength and degree of stiffness and ductility.

Whatever your needs in specialty steel wire — high or low carbon steel; round or shaped; in all sizes, tempers, finishes and grades—it will pay you to remember: FOR THE WIRE YOU REQUIRE...CHECK FIRST WITH WICKWIRE.

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WICKWIRE WIRE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
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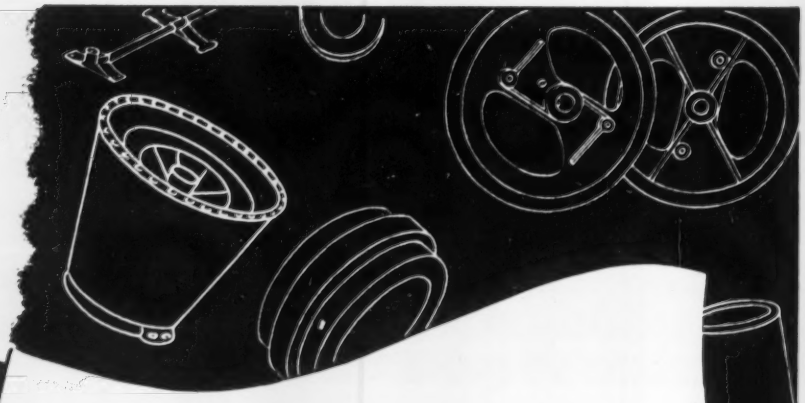

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Production AND Engineering NEWS AT A GLANCE

SURFACE CHECKS—Smaller shops can determine surface finishes to meet drawing specifications at relatively low cost with "surface sticks." They consist of various surface specimens individually finished to definite microinch readings and grouped together in finish-comparison bars. The operator holds the bar opposite his work in the machine to make a fast accurate visual comparison check of surface roughness, waviness and lay. Acme Industrial Co., Chicago, makes them up in either round plug or rectangular form in boxes accommodating 3, 5 or 8 assorted surface finishes.

DIVIDENDS OF PATRIOTISM—A patriotic alternate to regular nickel-chromium stainless steel is now paying off at the Budd Co. A severe nickel shortage came up at the start of the Korean War. The shortage caused the government to limit steel for most civilian uses to 1 per cent nickel maximum. The order sent Budd looking for a satisfactory alternate to furnish the life blood of its railway car production line. They went to Allegheny Ludlum to find out if it was possible to create a stainless steel that retains all the characteristics of 18-8 type material and do it with only 1 per cent nickel. Working together the two companies came up with TRC, so called because of its first commercial application as a trailer-rail car steel. Budd now has used some 600 tons of the new steel in rail cars and highway trailers. One big item they made no tooling changes of any sort. p. 94

LEAK SPOTTER—Freon-12, best known as a refrigerant, is finding a big new field as a leak detector. Under pressure it's a colorless, virtually nontoxic and odorless liquid. When released from pressure at room temperature it changes into a gas with an ability to seek out and escape through the finest openings in almost any material. Exact location of leaks can be found quickly with an electronic device or a gas-burning torch whose flame changes color in contact with the nonflammable Freon. The electronic unit, made by GE, is so sensitive it can uncover a leak so small that it would take 100 years for an ounce of Freon to escape.

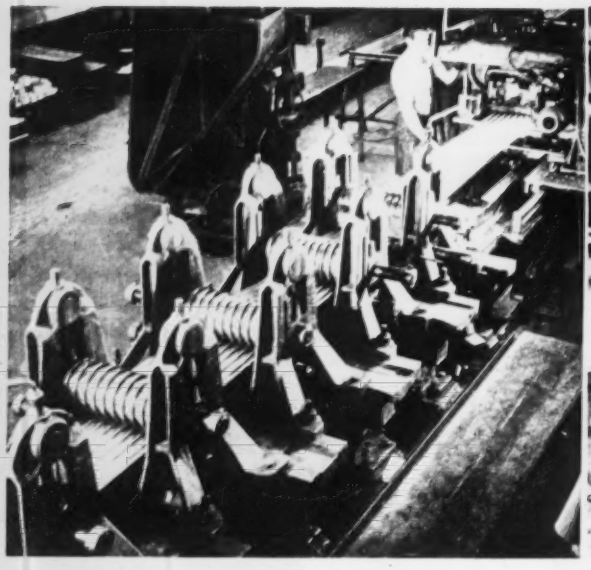
TOP HANDLERS — Originally many companies hired women as industrial truck and crane operators during the war years as an emergency measure and were surprised to find that the ladies performed with distinction. Carrier Corp., Syracuse, N. Y., went a little further and made a complete study of the efficiency, load spotting ability, etc., of feminine materials handlers as compared to the men. The ladies won in a walk. They maneuver their vehicles as well or better, don't have an after lunch slump like the men do and can place overhead crane loads more precisely, making them safer to work with and less likely to damage loads. Male truck and crane operators are outnumbered about 4 to 1 by women in Carrier plants.

CLIPPED-WING PRODUCTION—The aircraft industry which has just about everything flying along in high gear is usually faced with relatively slow production methods. There's a good reason for it though—most all airframe producers operate on a short lot basis. At Douglas' El Segundo plant, the engineers have altered some standard production machines to fit their short-run system. Slotted dies for the drop forge hammers permit a fork lift truck to lift from the sides rather than from the bottom of the die. This cuts handling time usually associated with die changes. Adjustable feeds on all punch presses is another example of higher production methods through ingenuity. p. 98

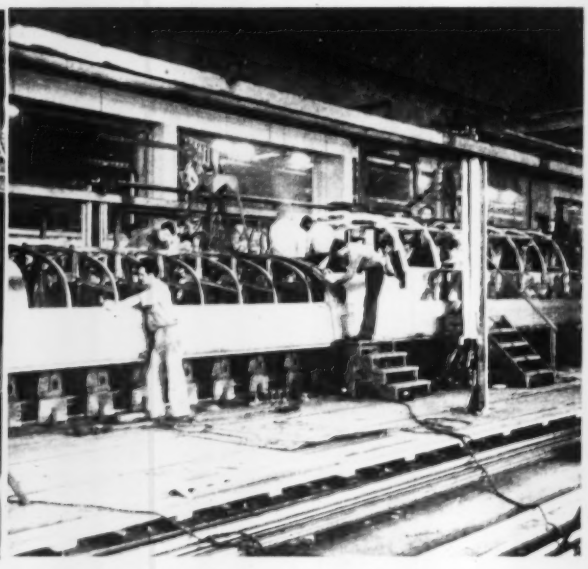
LOOKING GOOD—Rapid progress is being made on welding and working techniques for molybdenum the promising metal for high temperature use. The Ugine-Sejournet method looks good for extrusions. Two major problems that are being studied now are coatings to protect against oxidation and a so-called brittle phenomenon. Researchers working on brittleness find that high purity molybdenum with less than 0.001-per cent oxygen shows remarkable ductility characteristics. Concerning coatings, people in the know are predicting success within the year.

POCKET-SIZED POWER—Makers of the diminutive engines that power chain saws and the like use mass-production methods to lower cost, increase production and they have come up with interchangeable parts. An example is the crankshaft line at McCulloch Motors Corp. where shafts enter the line as rough forgings and leave as finished units at a rate of about one per minute. Machine tools in this line include five automatic lathes, grinders and induction heater for hardening. p. 102

INTRICATE BROACHING—A standard machine broaches intricate internal contours of aircraft engine parts in a setup devised by Colonial Broach Co., Detroit. The six identical contours between the internal lobes on the part are broached in two passes, three alternate contours in the first pass and the three remaining in the second. A two station fixture facilitates locating from offset holes in the part. A built up type broach is used incorporating inserted broach sections. Twelve dowels in the fixture, above and below the part, engage six holes in six lobes in the part, providing complete support of the lobes during broaching and holding the thin walled projections so as to effectively prevent distortion during the broaching operation.



Stainless is drawn through these rollers at Budd Co. to form corrugated strips for roof of railway cars



Fabricating the roof section of all stainless steel passenger cars. Strips are welded together here

New Stainless Stretches Nickel

A significant development of the Korean war is chromium-manganese austenitic stainless containing only 1 per cent nickel. It has strength and fabricating properties of type 301

By DR. ALLEN G. GRAY
Technical Editor

DEVELOPED as an alternate to regular nickel-chromium stainless steel, a new type manganese-chromium stainless with 1 per cent nickel is doing a good job at the Budd Co.

Designated as TRC because of its first commercial application by Budd as a trailer-rail car steel, this new grade of stainless has the composition: 15.0 per cent chromium minimum; 16.50 per cent manganese nominal; 0.10 per cent carbon maximum; 1.0 per cent nickel maximum, and 0.15 per cent nitrogen nominal.

For a long time Budd engineers have been convinced that high tensile austenitic stainless steel is the best structural material for railway passenger cars and truck trailers. It has advantages aside from obvious one of corrosion resistance. Its use, however, did involve a new philosophy of design. The problem was one of thinness and how to make it effective in compression or in panels.

Type 301 containing 17 per cent chromium and 7 per cent nickel did the job.

Really Needed—The Korean war started a search. A severe nickel shortage caused the government to limit steel for most civilian uses to 1 per cent nickel maximum. This order sent Budd looking for a satisfactory alternate to furnish the life blood of its railway car production line.

They asked Allegheny Ludlum if it was possible to create a stainless steel that retains all the characteristics of 18-8 type material and do it with only 1 per cent nickel.

Working together, Allegheny Ludlum did laboratory and mill research and Budd made on the job tests. Result: TRC. Budd has now used some 600 tons of the new steel in rail cars and highway trailers. By now a number of producers have supplied the steel.

Does It Work?—Budd states they made no tooling changes of any sort. A sheet of TRC can follow one of regular 301 through any of the fabrication processes and the operators do not realize any substitution has been made.

Looking at yield and tensile strengths, TRC is essentially equivalent to type 301 (see table). Type 430, a straight chromium stainless containing no nickel was unsatisfactory for Budd's requirements because the high physical strength of 301 could not be obtained. Some type 430 is used, however, for interior trim and applications other than structural.

Fabrication of stainless at Budd is typical of many sheet working plants except that stamping and deep drawing operations are on the lean side. Side and roof panels are corrugated by pulling strips of stainless through form rolls on a

TRC—STAINLESS

Chemical Composition

Chromium	15.00%	Min.
Carbon*	0.10%	Max.
Nickel	1.00%	Max.
Manganese	16.5%	Nominal
Nitrogen	0.15%	Nominal

*For gages 0.060 in. thick and below 0.12 max. carbon is allowed.

This all stainless steel rail diesel car that Budd builds contains about 27,000 pounds of TRC. This is part of an order that will bring total to 40

draw bench. Structural sections are formed on a power brake.

Typical of Stainless — Shearing or punching stainless steel requires more power than for ordinary carbon steel — because stainless is stronger and as a result its strength in shear is greater. The best shear blade is very hard at the edge, yet tough enough to resist the high impact loads produced.

Stainless may be readily handled in forming, drawing and spinning operations. As the tensile strength of the stainless is increased by cold rolling prior to the forming operations, its ability to be formed by these processes is decreased, for they all depend upon the ductility of the metal.

Fairly difficult stampings have been made of stainless with a tensile strength of 135,000 psi. In complex or very severe forming it may be necessary to anneal the piece between stages of the forming operation.

Drilling—Tools of high-speed are used when drilling stainless. The tool is ground somewhat more flat than standard, an included angle of about 140 degrees is generally used. Drilling is at a slower speed than for ordinary steels. The tool point should never be allowed to ride over the material without cutting.

With the possible exception of an indicated slightly greater drill wear, although this is not based on actual measurements, no change has been apparent in either tool or die life in going from type 301 to TRC.

Avoids Corrosion — Wherever possible fabrication is done by the Budd developed Shotweld system. This system is a resistance spot welding process which accurately controls and regulates the welding variables, principally time of current flow, to produce welds of adequate strength and freedom from harmful carbide precipitation.

Stainless is normally a solid solution obtained by heating to some 2000° F and cooling rapidly. Subsequent cold rolling does not substantially change this condition. Reheating to the range between 900 and 1400° F, however, may cause carbide precipitation. This metallurgical change in the structure of the steel lowers its corrosion resistance. The degree to which this change takes place is dependent on the temperature and also on the time of dwell within the harmful temperature zone.

The Shotweld method consists in greatly reducing the time of current flow in welding so that the very steep temperature gradient from the weld metal to the surrounding zones allows no time for deleterious carbide precipitation to take place.

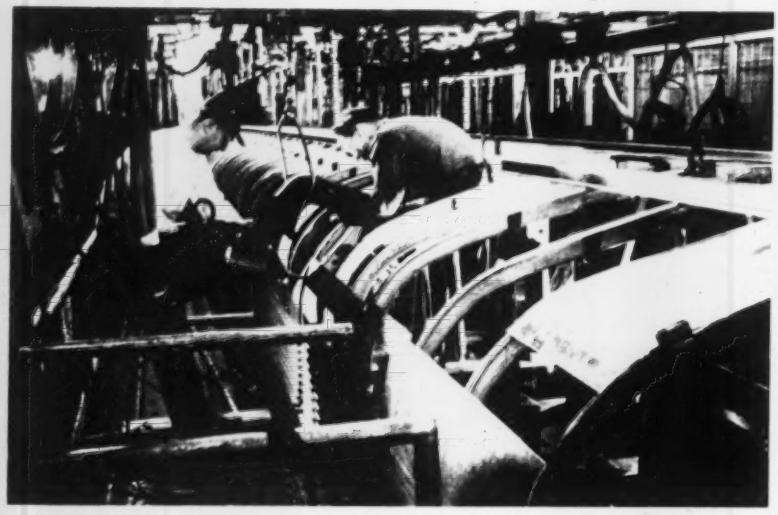
Par or Better — Tests in single Shotweld lap joints show TRC to have somewhat better fatigue strength than 301 in the same section and condition. In single Shotweld U-form tension specimens, fatigue strength of the two are about equal.

Some arc welding of stainless is done at Budd. Arc butt-welded specimens of TRC show 10 per cent higher joint efficiency in tension than 301. The same samples tested under fatigue stressing do not show a significant difference in fatigue strength. However, 301 has a higher ultimate tensile strength. Maximum of 0.10 per cent carbon specified for the steel minimizes possibility of intergranular corrosion resulting from carbide precipitation.

Resists the Elements — Budd is working hard to establish definite corrosion resistance data for TRC compared with 301. Emphasis is being placed on long-term exposure to various atmospheric conditions.

These tests have been under way for about one year in several locations, including industrial areas of Pittsburgh, New York, Philadelphia and Niagara Falls, rural areas, and at the International Nickel Co. testing station at Kure Beach. With exception of Kure Beach and Niagara specimens, which have not been evaluated, test panels show no evidence of corrosion.

On the basis of these and labora-



Shotweld process makes possible the use of stainless steel for entire car structure. Results obtained with TRC are fully equivalent to type 301

tory tests, Budd metallurgists rate TRC the equivalent of 301 for its railway car and highway trailer applications. If a percentage scale is used and type 301 is considered the standard, TRC rates 100 per cent on general atmospheric corrosion.

In 100-hour, 20 per cent salt spray test, TRC specimens showed slight attack, a shade less than type 430 test panels, while type 301 showed no attack. Budd scientists feel that salt spray tests mean very little in terms of performance of steel on railway cars.

No Difference—One of the points checked in the corrosion tests by Budd was the effect on corrosion resistance of lowering the chromium content of TRC about 1 per cent. In going from chromium content in the 16 per cent range down to the 15 per cent range no significant effect on corrosion resistance was noted.

Producers have less trouble rolling the 15 per cent chromium type than they had when they tried to handle a 16 per cent chromium version which was in the picture early in the game.

Not Easy—Most producers feel that there are still mill troubles in working with the chrome-manganese steels. Difficulties are sometimes encountered in breaking down ingots into slabs. Heats may develop edge cracks in the blooming mill. Yields have been low at times.

Beyond the slab stage rolling difficulties tend to smooth out. Production is still principally strip; sheet is scarce.

Although progress is being made on mill problems, producers feel that there will be some mill troubles as long as they have to work with ingots containing 1 per cent maximum nickel. Relaxation of government restrictions even to the extent of allowing 2-3 per cent nickel would likely eliminate many of the mill's present problems with this steel.

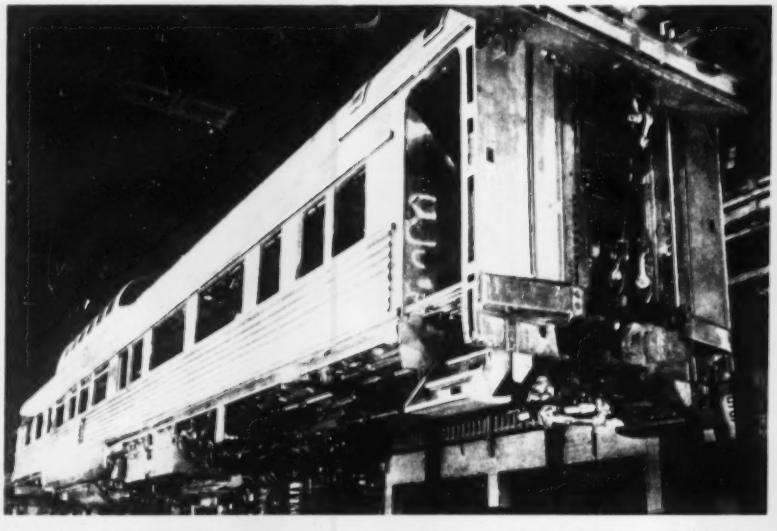
Some producers still feel same as they did early in the game that the chrome-manganese stainless is being produced on an emergency basis for manufacturers who have been cut off from the 18-8 type because of government restrictions on nickel, and who cannot use the straight chromium type, such as 430, because of engineering reasons.

In spite of these mill problems, however, Budd reports that they are receiving TRC at a rate adequate to meet their production schedules. They feel that their success with the steel gives promise of its remaining on the scene even when present nickel restrictions are lifted.

Some metallurgists in chrome-manganese steels from the start feel that a permanent stainless useful for some applications might take the form of a TRC with chrome boosted up to 17-18 per cent and nickel raised to 2-3 per cent.

Old Idea Dusted Off—The fact that manganese, like nickel, will produce an austenitic structure in steel is not new. In the early twenties, metallurgists at Union Carbide's Electrometallurgical Division investigated and patented a whole series of chromium-manganese stainless steels. In 1940, when nickel became short those steels which indicated greatest promise for combined corrosion resistance and strength to compete with chromium-nickel steels were subjected to an extensive series of tests.

They found that the cold rolled



Nearly complete all stainless passenger car progresses down assembly line

REVISED TENTATIVE INFORMATION FOR SUPPLIERS OF STAINLESS STEEL TYPE TRC TO BUDD CO.

Temper	Finish	Yield Strength Min.	Tensile Strength Min.	Tensile Strength Max.	% Elong. min.	Bend Radius Axis Par. To Gr. & Angle	Desired Max. Rock B
LT	2D	40,000	80,000	115,000	50	Zero Rad. 180	95
	2B	45,000	80,000	120,000	40	½T-180	105
ST							
0.020 & Under	2B	60,000	110,000	135,000	35	½T-180	
Over 0.020	2B	60,000	110,000	135,000	35	1T-135	
MT							
0.020 & Under	2B	75,000	120,000	150,000	25	½T-180	
Over 0.020	2B	75,000	120,000	150,000	25	1T-135	
HT							
0.020 & Under	2B	110,000	140,000	165,000	18	½T-180	
0.020 to 0.156	2B	110,000	140,000	165,000	18	2T-135	
Over 0.156	2B	100,000	125,000	165,000	18	2T-135	
VHT							
0.125 & Under	2B	135,000		185,000	10	3T-135	

The minimum yield strength and bend properties must be met. All other mechanical properties are desired values. Values that are not rejection limits but aims.

manganese and manganese-chromium steels could be readily formed, drilled and machined and they were easy to weld. Physical tests showed these steels to have strengths equal to the best of stainless steels with no practical loss in ductility.

At that time a 16 per cent manganese 12 per cent chromium composition containing about 0.3 nickel, 0.2 silicon, and 0.14 carbon was singled out for further study. This steel could be cold-rolled to high strength with retention of ductility. Another property noted: High resistance to atmospheric corrosion.

Welding operation on small section of all stainless steel railway car

In the Picture Too—Where does manganese fit into the TRC picture? Both low carbon, low phosphorus ferromanganese and electrolytic manganese are being used for the chrome-manganese stainless. Electrometallurgical Division of Union Carbide & Carbon Corp. produce a grade of ferromanganese with maximum 0.07 per cent carbon and maximum 0.06 per cent phosphorus for the purpose.

The fact that high purity manganese can substitute for critically short nickel in producing an austenitic stainless has lent impetus to expansion in electrolytic manganese.

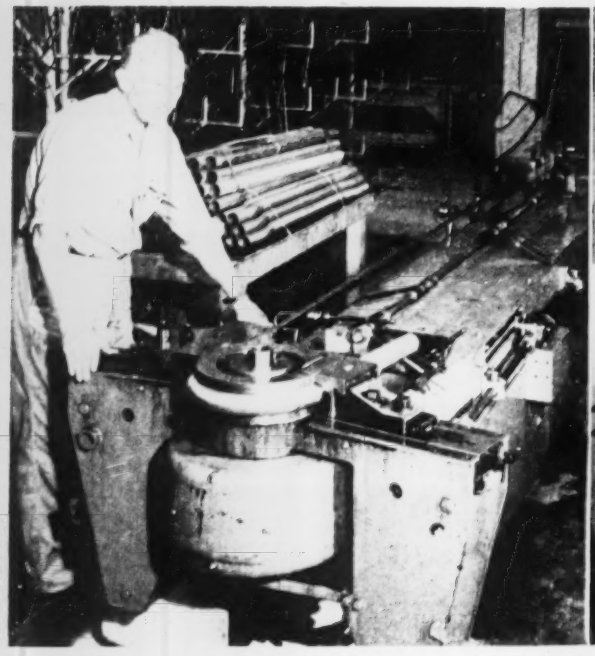
A relatively new product it contains 99.9 per cent manganese and is almost entirely free of carbon, phosphorus, silicon and other impurities. Supplied as a chip, it is the end product of an electrowinning process. Producers feel that it is competitive at about 30 cents a pound with the low carbon ferromanganese.

More Electrolytic—Expansion is on two fronts. With the help of a $2,250,000 government loan, the Electromanganese Corp., Knoxville, Tenn., is expanding its facilities to double its production of the metal which is now at a level of 7.2 million pounds a year. By midyear production at this company is expected to be at the rate of 15 million pounds yearly.

Electrometallurgical Co., long a producer of ferromanganese, has obtained a certificate of necessity of the order of some $13 million to construct an electromanganese plant in the Marietta, O. development area. When this plant comes in, total production may be at potential rate of twenty to thirty million pounds a year.

As to if this will be enough is anybody's guess. Whether or not the 16 per cent manganese-15 per cent chromium version sticks is elementary. It will probably lead to some chromium-manganese steels which will be modifications and which will be found very useful when increasing amounts of elements are available or better known, that will give a more completely austenitic steel than is possible with the present combination of nickel and nitrogen.

Perhaps the 1 per cent nickel variety of this new stainless won't stick. But there is good evidence that steel producers are giving plenty of thought to the substitution of some manganese for nickel to keep the properties of the 18-8 type. The end result may be a compromise but chances are good that some form of the manganese-chromium stainless, perhaps now in the experimental stage, is here to stay.



This tube bender was modified to facilitate short-run production of small radius bends. Controls for each phase of the bending were added to the original design

Truck with hydraulically adjustable forks deposits drop hammer die on the bed. No overhead cranes are required in either the storage yard or drop hammer department

Modifications Speed Short-Run Operations

Standard production machines at Douglas' El Segundo plant are altered to fit peculiarities of aircraft manufacture. Plant engineering department gets the job and the credit

By D. G. McCONNELL
R. C. BEAVER
Machine Design Engineers
Douglas Aircraft Co.
El Segundo, Calif.

WHILE most types of standard production machines are employed in some facet of the aircraft industry, many of these machines require certain modifications in design or principle to make them efficient in aircraft work. Generally speaking, the most outstanding feature of these machines that of high-speed repetitive production of the same part is the one feature that cannot be used efficiently in the airplane shops.

The value of this high-speed repetitive production feature is greatly nullified by the relatively short production runs encountered in most aircraft work. Machine setup time is of little consequence when the setup will be employed over a six-months' period to turn out a hundred thousand parts. But setup time becomes extremely important when only a hundred parts will be produced, and several setups each day are required. Many more production runs in the aircraft industry will vary downward to 50, 25, or even a dozen parts.

Modified Standards—In general, most production machines are a fairly standard item and are purchased as such by the aircraft industry. The modifications to simplify setup, reduce die costs, and minimize service and personnel requirements, are made after the machine is installed. At the El Segundo division of Douglas Aircraft Co., these modifications are studied, engineered and installed by the plant engineering department. A group of specialists are constantly at work, trying to modify standard production machines to secure more efficient short-run production.

While the details involved in these modifications are limited to specific machines, the idea behind each modification is generally applicable. We will therefore confine our discussion in this article to cases where the idea is paramount, and where detail may be worked out according to existing conditions.

Consider Drop Hammers — Drop hammers are a widely used standard production tool. In some industries, a drop hammer may be used for days, or even months, in repetitive production of the same

part. When and if the hammer dies are changed, the actual time required and the inconveniences encountered are of little consequence.

In the aircraft industry, this situation is reversed. In most cases, the drop hammer dies have to be changed several times each day, and setup time requirements are of paramount importance. At Douglas, we tackled this drop hammer die changing problem as the one facet in the process where major innovations could be made to improve short-run production.

Slotted Dies — The same 3600 drop hammer dies in use were redesigned with cast-in slots along opposite sides of the die. Purpose of these slots is to permit use of a fork lift truck, lifting from the sides rather than from the bottom of the die. Concurrent with die redesign, two fork lift trucks, one of 10,000-pound capacity and the other of 30,000 capacity, were equipped with hydraulically adjustable lift forks.

With this equipment, the lift truck operator can approach a die, adjust the width of his lift forks to fit in the slots along each side of the die, lift it, transport it to the drop hammer department, then insert it over the bed of the drop hammer. At this point, the lateral shift arrangement is used to position the die exactly over the hammer bed before it is lowered into position. No pinch bars are used for final positioning; no overhead cranes are required throughout the die changing process.

Two-Way Radios—To further expedite frequent die changes, each of the lift trucks is equipped with a low-power industrial radio transmitter and receiving unit, tuned to a similar unit in the dispatcher's office. When the drop hammer operator is ready for a die change, he telephones the dispatcher the necessary information. The dispatcher then contacts both lift truck operators and passes this information along.

One truck operator then goes to the drop hammer, removes the old die from the hammer and transports it to the storage area. Meanwhile the second truck secures the required new die, brings it to the drop hammer department, and sets it on the hammer bed. The entire die changing operation requires but a few minutes.

Easy Storage—Several other advantages have accrued from our new drop hammer die handling system. Hammer dies can be stored in any area not equipped with an overhead crane. No pallets are required in stacking the dies (because they are lifted from the sides), thus giving a firmer and safer pile. Dies can be stored in any unused outside area, and stacked in piles about 5-feet high.

It is easy for the truck operator to lift aside dies he does not want to secure one deeper in the pile. Despite the huge size of our drop hammer department, only three men are required to handle all the die changing work one operator on the smaller lift truck, and an operator with a helper on the big unit.

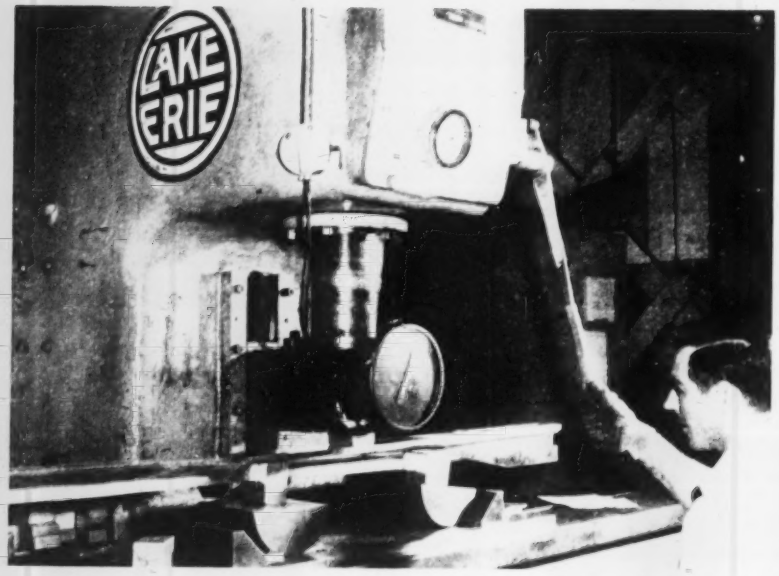
Tube Bending Machines — While modifications to improve drop hammer production were confined entirely to machine setup and servicing, modifications in the machine itself were necessary in our tube bending department. We started this operation with a No. 2 Pines aircraft tube bender, ideally tooled for high production repetitive bending of long radius bends. The machine was fully automatic, with only a start-and-stop button and a control for operating the tube clamp.

We soon discovered, however, that automatic sequence operation of the tube bender was not compatible with the high precision, small radius tube bending necessary in advanced aircraft work. Many of the bends we had to make were prototypes, and production runs on others were small. More control of the bending operation was needed to produce the types of bends required.

Console Control—To provide this control, a console-type control cabinet was designed and installed so that each phase of the tube bending operation could be individually controlled by the operator. Today, separate controls are employed for the rotating head, the mandrel, the tube clamps, and for starting and stopping. The clamping block is operated separately from the follower block, and the rotation sequence is separate from either clamping operation. By separating the clamping operations, a tube with more than one bend may be rotated and checked before the follower clamp is moved into position.

Other tube bender modifications included bringing all the tube bender operating surfaces into a common plane. This was accomplished by designing an auxiliary bolster plate with T slots as a positive

Hydraulically controlled spinning tool designed for spinning heavy gage material. Spinning pressure is controlled by valve under the operator's thumb



Dial indicator on this hydraulic straightener measures deflection during straightening. Over-straightening is calculated to just offset springback

clamping surface for the wiper die. The original back-up stock for the clamp block was redesigned using 4130 chrome moly steel. The side block, originally of hard brass, was redesigned using 4130 chrome moly steel with hard brass inserts in the slide area.

Using this modified tube bender, our tube bending department is constantly precision-bending tubing material that is normally classed as "unbendable," and have produced many "impossible" one-diameter bends in stainless steel, aluminum, and alloy steel tubes.

Press Control Unified—Not long ago, a new Bliss 800-ton hydraulic press was installed at the Douglas El Segundo plant. While this press, in its original form, was ideal for high-speed repetitive metal forming work, die changing was complicated by the location of controls at four different places around the press. Necessity of changing the press dies several times each day, and also the fact that normally only two men were employed on the press at a time were burdensome complications.

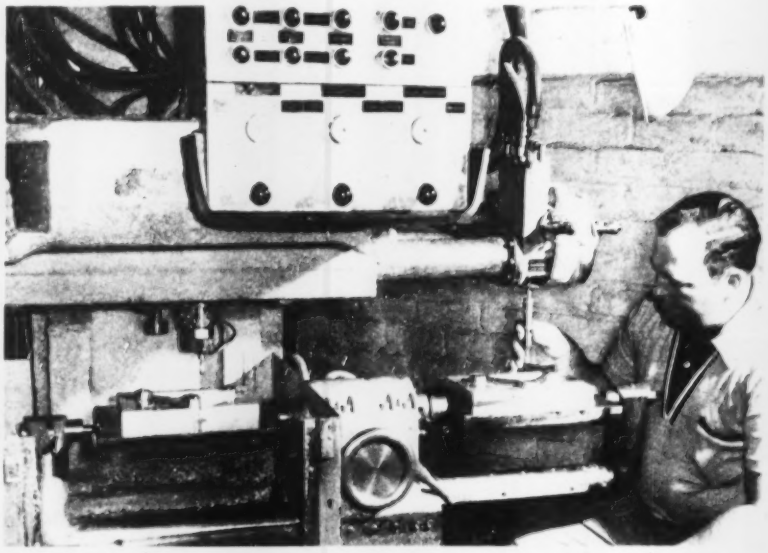
After some study, the Douglas plant engineering department came up with a single cubical control panel that could be operated from one position. All controls, including ram pressure, downstroke and final pressure, stroke limitation, and draw ring cylinder pressure, were led into this single control station. This consolidation of controls has resulted in considerable time-saving insofar as die changing is concerned.

Built Router Motor—While routers are suited to short-run production work, most of them are designed for cutting relatively thin gage material. As air speeds increased and airframes became stronger, we began routing parts from heavier materials. Conventional router motors would not take the beating incurred by this heavier routing work. Now we are using a Douglas designed router motor. All parts for this motor, except the bearings, are made in the Douglas shops.

This motor delivers from 5 to 7½ hp at 20,000 rpm. It is cooled by a mist of lard oil-kerosene mixture blown through spiral grooves around the motor case enroute to its final objective to lubricate the single-flute cutter. A secondary cooling system is incorporated which blows a special bearing oil lubrication mist directly through the motor and then out the nose.

Spinning Problems — On deep draw work in heavy gages it became impossible for a single man to manipulate a conventional spinning tool or bat. Two men per tool were tried, but this combination prevented either man from obtaining the necessary metal flow feel so important in critical metal spinning work.

A hydraulically operated metal spinning bat was designed and built, wherein the main spinning pressure was applied hydraulically, but enough manual pressure was used so that the single operator could obtain the necessary feel. With this tool, greater or lessened spinning pressures are obtained by a hydraulic valve control located



This rotary fixture permits automatic orientation of parts and pattern. Complex contours are quickly duplicated without any additional machining

convenient to the operator's thumb.

It was also discovered that available metal spinning lathes operated too fast for most aircraft production work in the heavier gages. To offset this, clutches were designed and installed to permit lathe operation at variable speeds downward to 50 rpm.

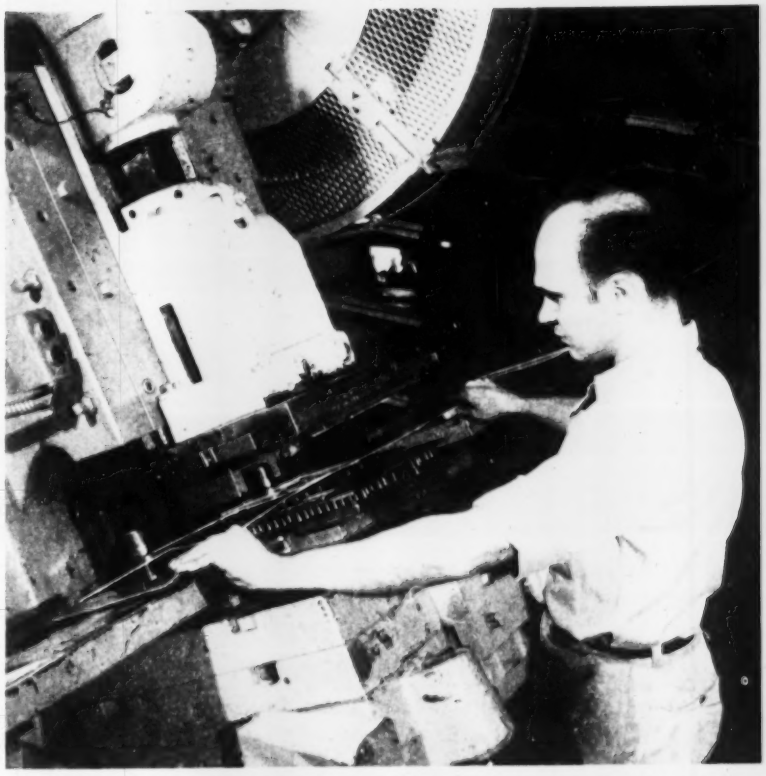
Precision Modifications—Some of the modifications in standard equipment are made for the sole purpose of obtaining the high degree of precision necessary in all aircraft components. One of these modifications appears on our hydraulic straightening presses. Critical dial indicators are installed on each machine.

These indicators are actuated only after the part becomes critically straight in the press, then measure the over-straightening necessary to exactly offset spring back when the part is removed from the press. After the first part is straightened and spring back measured, each subsequent part can be critically straightened using the same dial indication.

Some Improve Productivity—In a few cases, standard machines are modified to improve their production potential. We installed a high-cycle router motor on a Hydro-Vari machine, then equipped it with a powered horizontal rotary fixture for the orientation of part and pattern. Thus despite complicated external contours on the part, a pattern may be duplicated rapidly and efficiently, and without the necessity of subsequent machining on lug areas, attachment areas, or other external contour variations.

Other Innovations—At Douglas, we have made many other innovations to improve short-run production in our punch press department. Some of these modifications had to do with machine operation, others with the problem of constant die changing, and still others with material handling and conservation.

To begin with, all our punch presses are installed with a sharp backward slant so that punched blanks will automatically fall from the dies backward into a container at the rear of the machine. Rubber of compression washers of about Shore 40 hardness are glued on the pierced blank templates to clear blank from dies. This eliminates the necessity of the operator to pause between each operation to remove the blank.



Raising the lever just above the operator's left hand releases the die and when lever is pulled forward again, the new punch die is clamped into place

Adjustable Feed—Secondly, each of our punch presses has been provided with an adjustable feed table so that all material feeding into the press is correlated with die height and angle. The need for blocking or angling of the material is entirely eliminated. A second adjustable table beyond the dies receives the scrap strip.

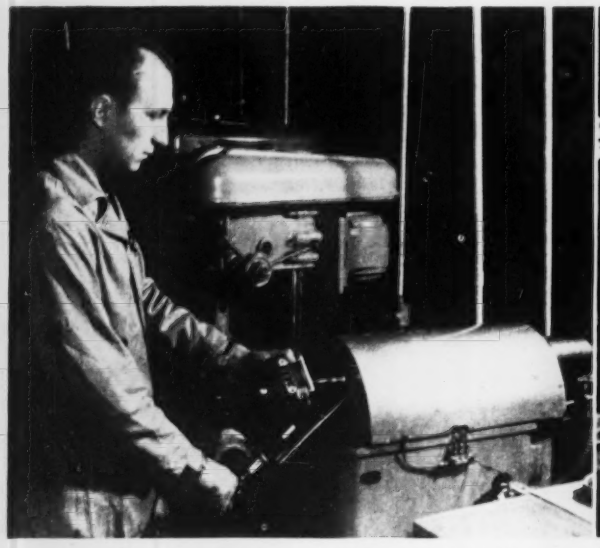
Another innovation was to provide each punch press with quick acting clamps for die installation. A single action releases the dies being removed; another action clamps the dies after they have been centered in position. The actual time involved in die changing is negligible.

Strip Pre-Cut—Raw material for the punch press department is furnished in pre-cut strip form. Prior to the production of each part, the width of strip stock from which it can be punched with a minimum of waste is determined. Production orders then denote the width of strip to use, and punch operators are further relieved of a responsibility.

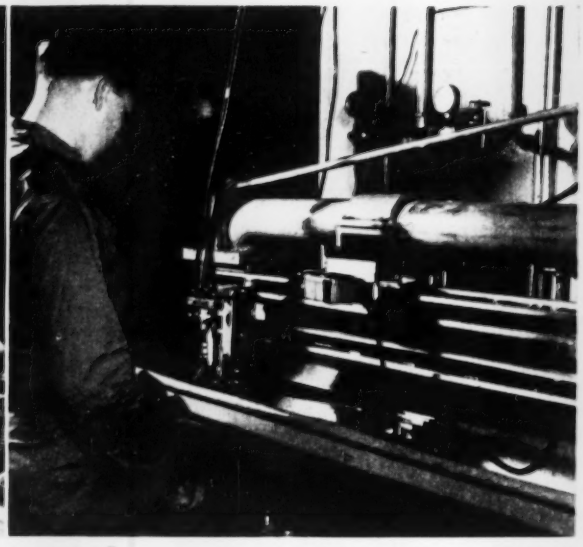
When a production order enters the punch press department, it goes first to the man in charge of die storage. Here the proper die set is selected and sent along with the production order to the material man. The material man then places the specified strip stock, enough to produce the order, along with the dies and production order, and delivers the entire package to the punch press on which the parts will be blanked.

Next Order Waiting — Each punch press is provided with waiting tables just above the feed table. Thus, when the press operator completes one production order, the material and dies for the next are ready at hand. He merely releases the old dies, places them on a cart for return to storage, slips the new dies in place, clamps them, pulls the raw material down onto the feed table and is ready to go.

After the above innovations, production in the punch press department, without additional machines or personnel, increased an average of 50 per cent.



Cylinder walls are knurled on this McCulloch-built machine to a finished depth of about 0.003-inch. This improves service life and also lubrication properties



Another company-designed and built machine is this one for flame hardening the outer edges of saw cutterbars. Oxyacetylene flame and water spray are on one mounting

Production Is Heavy On Lightweight Engines

Builder of power chain saws and other engine-driven products needs highly integrated operation. Specially built machines turn out complicated parts in volume

By NORMAN LYNN
Los Angeles Correspondent

PRODUCING identical parts requires integration, or close control of all phases of the manufacturing operation. In addition to integration, alert managements are finding specialization in machine utilization can also bring large savings in production. For example, one minute saved on an item produced at the rate of 50,000 a year can be worth as much as $5000 saved in labor and overhead.

A case in point is McCulloch Motors Corp., Los Angeles, manufacturer of power chain saws, which has carried the techniques of specialization and integration of machine tools to a fine degree of perfection. The McCulloch plant is designed for mass production of lightweight engines and engine-driven products. Main plant area is approximately 232,000 sq ft, exclusive of detached buildings.

Products Complicated — McCulloch's products are relatively complicated but lend themselves to volume production. Manufactured are: Model 5-49, model 7-55, chain saws; earth drills, post hole diggers, powered and portable centrifugal pumps, lightweight engines for military target airplanes, and, just recently added, a new and quite revolutionary twin-rotor helicopter.

The vast majority of components for the company's products are manufactured within its own plant, as a means of controlling quality and delivery. The company uses a variety of special purpose machine tools to achieve high production and high quality.

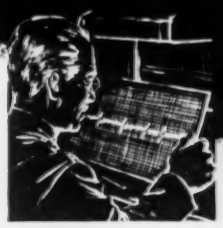
Crankshaft Production — The crankshaft line is one of the features of the McCulloch plant illustrating its mass production capabilities. Crankshafts enter the line as rough forgings and leave as finished units at a rate of about one per minute on current schedules. Machine tools, worth $250,000 in this line alone, include five automatic Sundstrand lathes equipped with top, front and back slides, and air chucks, Norton grinders, and induction heater for hardening.

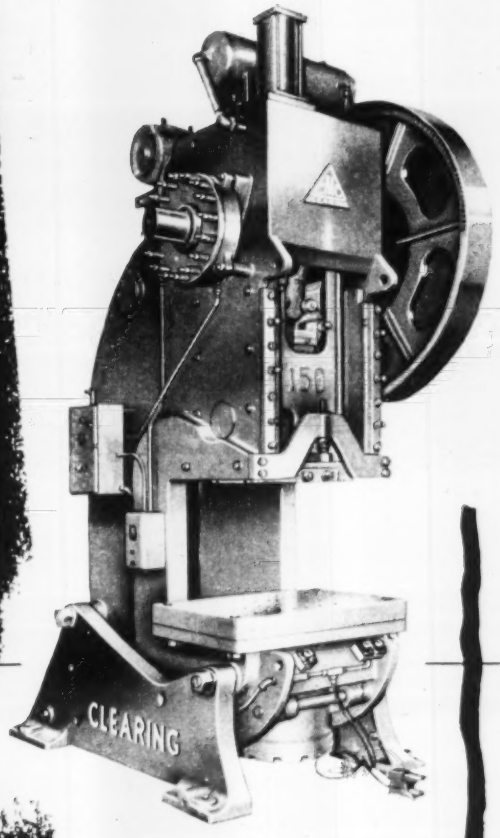
The main saw engine assembly line, moved by a chain-driven conveyor, is manned by 19 operators, each one performing from three to 13 operations, totaling 146 operations. Average output of engines per day is 300 for an 8-hour shift. From 45 to 60 minutes are required to assemble each engine.

Fast Piston Turning — Sundstrand automatic lathes are used to machine model 3-25 pistons. In 11 tool operations completed in 24 seconds, the lathes turn the outside piston diameter to tolerance of 0.00011-inch on outside diameter, face the dome to 0.0006-inch, rough and finish cut and chamber ring grooves. The piston shirt is counterbored before this lathe operation takes place. An 11-operation tolerance check insures acceptance.

A Barnes boring machine for boring pistons is driven by five electric

An Electrocardiogram for an O.B.I.?





What if doctors could re-design the human body? Maybe the first thing they'd do is strengthen the heart–fix it so it wouldn't give out before its time. A tough job for the doctors, but with presses it's a different matter. Because for years that's essentially the kind of treatment open back inclinable presses have had from Clearing engineers.

That's why the frames are all steel weldments, with more rugged bearings, pitman connections and adjustments. Clearing designers have analyzed functional disorders and engineered preventive maintenance into the press. So if you're looking for presses that stay young and trouble-free longer, find out about Clearing inclinables.

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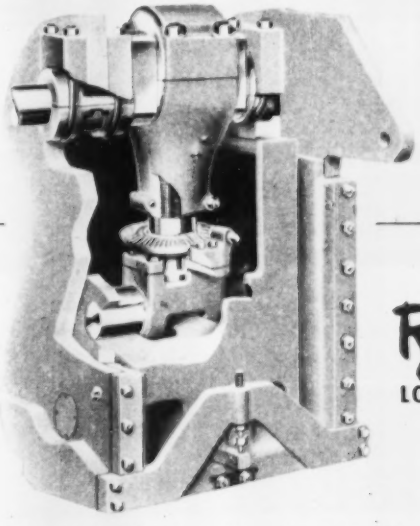

Illustrations on this page are of the Clearing 150 ton inclinable press.

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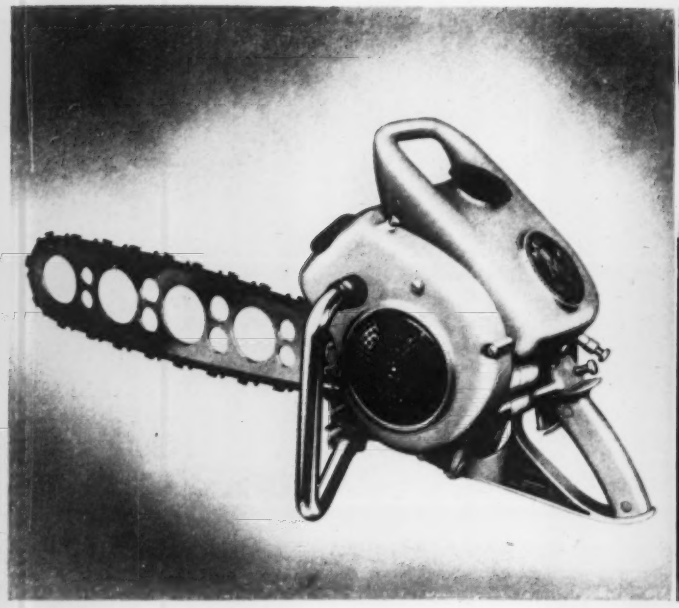

Finished hand saw weighs 25 pounds, develops 3 hp and is able to cut through 2-foot trees and logs in 1 to 2 minutes. The lightweight engine is McCulloch design

Stress relieving is done in this thermal cabinet which is heated by banks of lamps, 35 to a side. Speed can be set accurately according to thickness of the part

motors; four 3 hp and one 1 hp. Simultaneously three cylinders are rough bored and three finish bored while the operator is loading the third set of three cylinders. The machine is equipped with dial controls for indexing, starting, advancing; and cooling is operated manually or automatic. Nine small mechanical clamps hold the cylinder in place on an indexing table.

Cylinder Walls Knurled—To increase service life of cylinders and to improve lubrication properties, a special machine to knurl cylinders was built by McCulloch. After being knurled to a depth of 0.007-inch the cylinder is honed, chrome-plated, and honed a second time to remove fuzzy excess that tends to build up around edges of knurl. The finished depth of the knurl after honing is approximately 0.003-inch.

The knurl is rounded in cross-section and at the ends to avoid short corners, which are difficult to plate. An air cylinder actuates the cam in the knurl holder to advance the knurl to the required depth. Three rollers bearing against the inside diameter of the cylinder take thrust and compensate for any variation in bore.

Cycle Automatic—The knurling head is connected to the lead screw and rotates during the boring operation. A lead screw through a fixed nut advances the knurl along the length of the cylinder. A limit switch in a fixed location at the rear of the machine is acted upon by a cam on a movable cylinder assembly to shut off air pressure and retract the knurl from those areas on which no knurl is required.

In one cycle, the knurling head moves into the cylinder approximately $\frac{1}{2}$-inch, then a cam actuates the limit switch causing the knurl to feed into all of the cylinder. Knurling continues until the intake and exhaust ports of the cylinder are reached.

A cam actuated limit switch on the unit shuts off the air and retracts the knurl. Another cam feeds the knurl to the proper depth. The machine knurls on both forward and advance strokes, with only one pass being required per piece. Production is 70 pieces per hour.

Hardening Cutter Bars—Another special McCulloch-designed and built machine is one for flame hardening. This machine hardens the outer edge of the saw cutter-bar from 79 to 84 on the Rockwell hardness A scale at a load of 60 kilograms. Output of bars 18 to 35 inches in length is 300 per day on an 8-hour shift, and 150 to 200 per day for sizes 40 to 60 inches. The setup can be changed for any size blade in minutes. Acetylene and oxygen gas mixture is used with a regular torch head and specially adapted tip.

Warm water is sprayed along with the torch in hardening and both gas and water are automatically shut off when the end of the bar is reached. To start again, the torch is automatically set off by natural gas pilot. Correct amount of water and flame is timed for adequate hardening. A variable speed transmission is used to set speed for particular hardening of bar and torch is guided by rail chain.

Stress Relief—To relieve work hardening of machined parts the company designed a special thermal machine. The machine has banks of four rows of lamps, 35 lamps on each side. The part is carried through the machine between the lamps by a conveyor at the top of the machine.

Speed is controlled by a Microflex automatic timer that can be set accurately according to thickness of the part. To provide a temperature gradient along the line of travel, the wattage of the lamps varies from 350 watts at the start of travel to 150 watts at the end.

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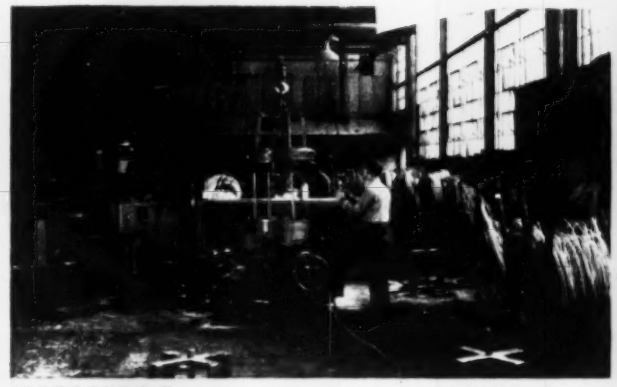

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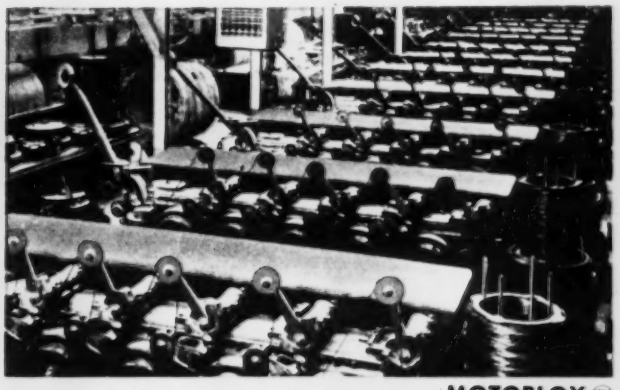

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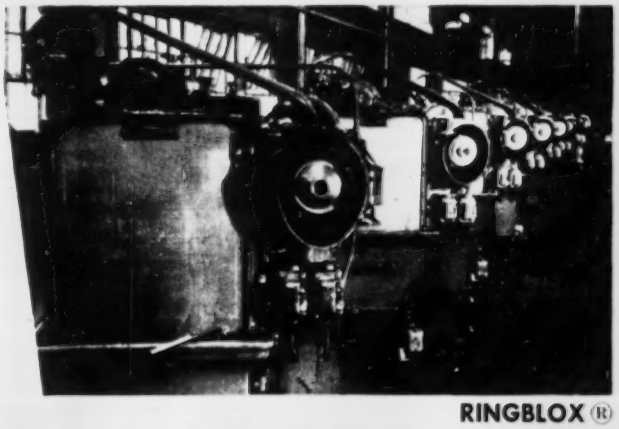

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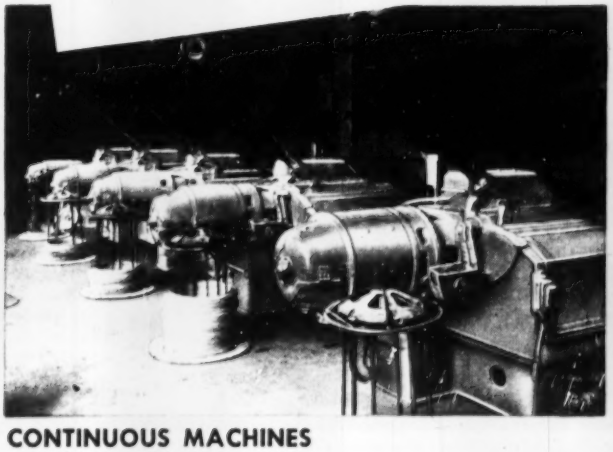

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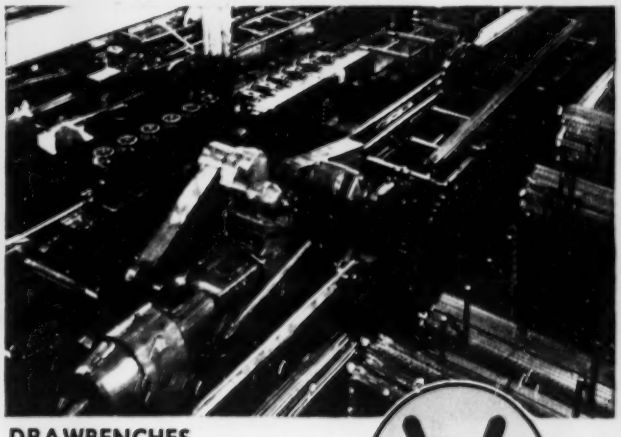

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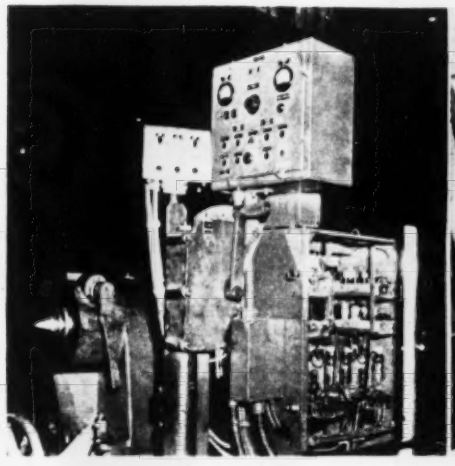
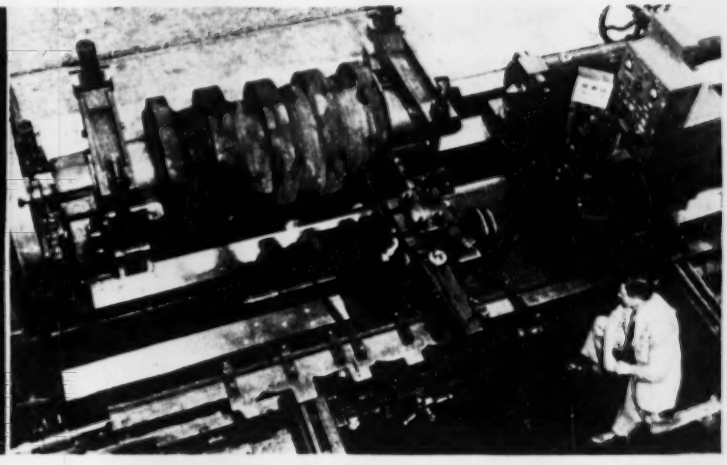


Control panel and cabinet for electronic equipment are mounted near the operator



Flat template on adjustable holder is shown in the foreground. Cast steel shape roll being turned is mounted in the machine's neck holders

Lathe *Contours* Mill Rolls Automatically

All-electronic duplicating equipment controls the 60-inch tool to generate complex body outlines. To assure solid mounting, rolls are suspended on neck holders

FULLY AUTOMATIC contour duplication becomes an accomplished fact on a 60-inch roll-turning lathe U. S. Steel Corp. installed recently in its Homestead, Pa., roll shop. The setup is said to be the first machine tool of this size to have all-electronic duplicating equipment for controlling cutting action.

Also for the first time, according to the builder, a lathe of this type is used to generate on steel mill rolls the complex body outlines that produce beams, channels, ship sections and other rolled steel products.

A major advantage is indicated by the extreme flexibility of the lathe's control system and ease of maintaining electronic duplicating equipment. Pushbutton manual control of all motor-driven toolfeeds permits fast roughing of individual passes and rapid automatic roll finishing. Another advantage is found in longer roll life and resulting reduction in mill downtime through maintenance of extremely close tolerances on roll passes.

Floating Tracer Stylus—The duplicating device guides cutting tool motion from a flat template whose contours are exactly those of the roll to be machined in the lathe. A minutely-varying degree of angular deflection in a floating tracer stylus moving along the edge of a template is signalled to a control panel.

These signals are electronically amplified, interpreted and fed to two electric motors. The motors' combined action in response to the signals keeps the stylus traveling and hugging the template. Since the cutting tool is mounted on the same movable part of the lathe carriage as the stylus, tool travel duplicates the path of the stylus. Tool deflection presents no problem when taking heavy rough cuts. Compensation can be made during lighter finishing cuts.

Performance Record — Mackintosh-Hemphill Co., Pittsburgh, designer and builder of the lathe, reports it cuts estimated finishing time from 156 to 49 hours on one type of roll used to produce structural shapes at the Homestead shop. On another, time is cut from 196 to 49 hours. Discounting setup time, the firm says rate of metal removal ranges from two to one through six to one in favor of the contour lathe as opposed to the standard setup.

Using tungsten carbide tools, the unit turns at headstock spindle speeds up to 32 revolutions per minute. Present roll shop practice on the Mackintosh lathe calls for surface speed of 60 sfm on iron and 200 sfm on steel. Additional time and labor are saved by a continuous chip disposal conveyor which discharges into removable buckets in pits at end of the bed.

Roll-Housing Mount — Some mounting problems presented in machining rolls that may weigh as much as 35 tons are solved by mounting the roll solidly in roll housings. The steel company's lathe is said to be the first of its size capable of contouring rolls while they are supported on their necks as in the mill in the special housings.

Mounted on the lathe bed, the completely adjustable housings duplicate actual rolling mill conditions, lending stability to the rolls being machined.

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Now in Commercial Operation
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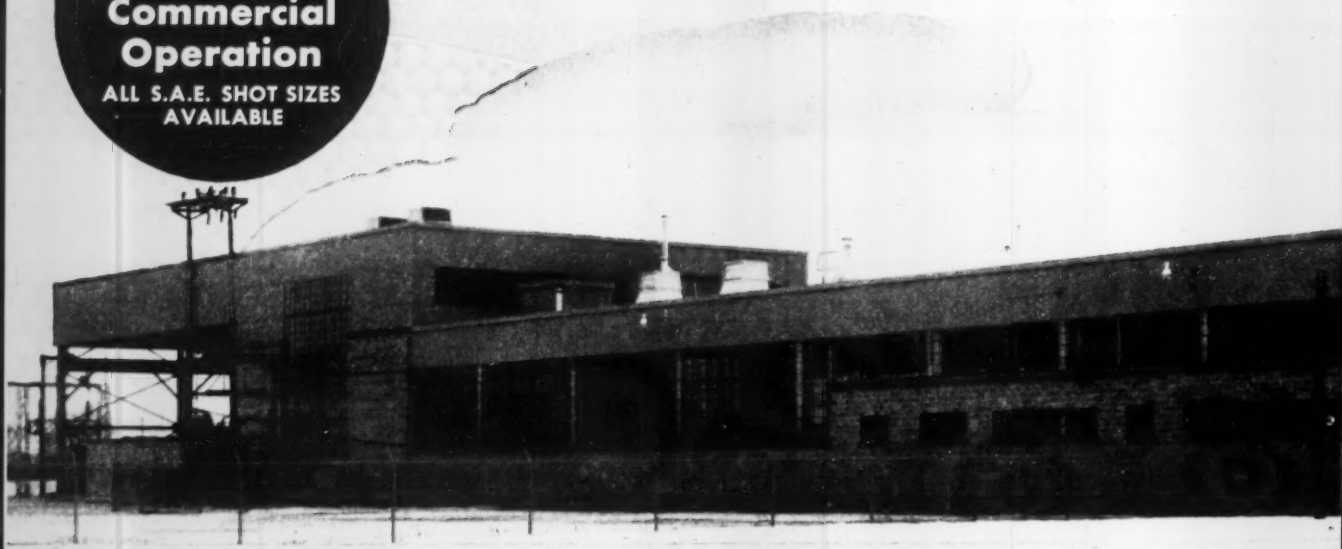
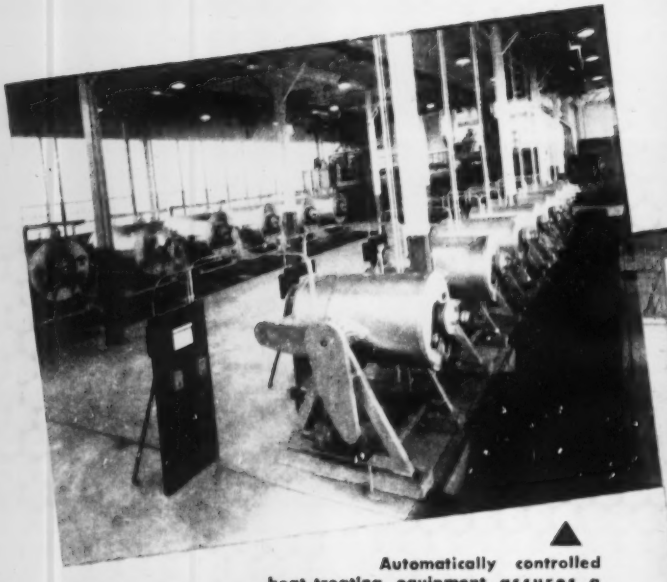
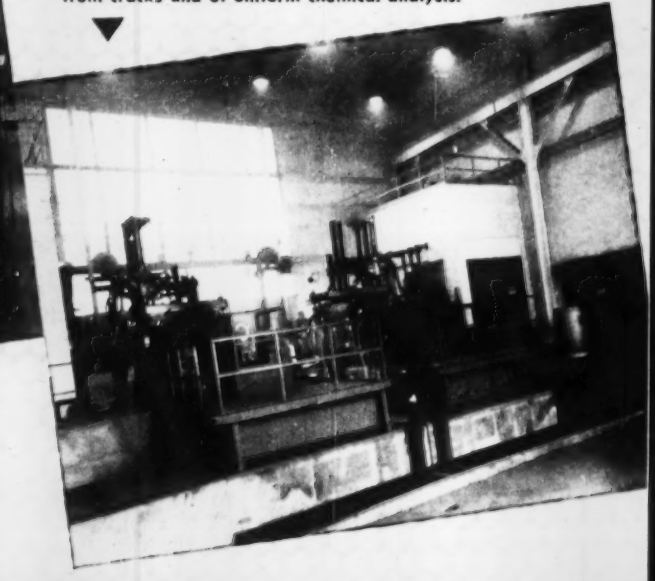


▲ New from the ground up, the building was designed for one purpose only — to produce the world's best abrasive.



▲ Automatically controlled heat-treating equipment assures a non-varying metallurgical structure of tempered martensite for long life and economical cleaning.

Electric arc furnaces and *American's* patented shotting process produce round, solid shot free from cracks and of uniform chemical analysis. ▼



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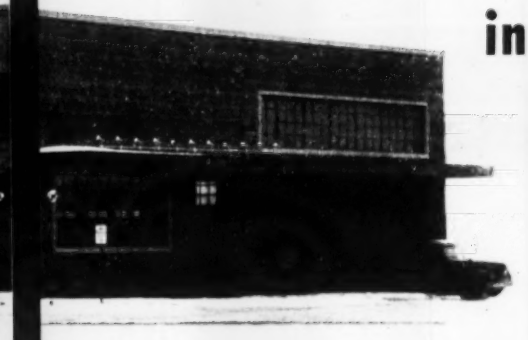

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High production units weld 10 studs to farm machinery rasp bars in 80 seconds. Assembly and dynamic balancing is easier, so is field replacement of worn rasps

WAR-BORN ART of stud welding, which saved the shipbuilding industry 100 million manhours in three years, increases production and eliminates troublesome assembly problems on harvester-threshers built in the E. Moline, Ill., plant of International Harvester Co.

Use of granular flux-filled studs in place of through bolts which formerly fastened rasp bars to the stripping cylinders of combines, corn-shelling and cotton-ginning equipment is helping farm operators, too. The job of replacing worn rasps is greatly simplified, since it was difficult to remove fastening nuts without turning the countersunk bolts.

Faster Output—A special five-gun stud welding production unit developed by Nelson Stud Welding, a division of Gregory Industries Inc., Lorain, O., is used to end-weld the ten threaded studs to the back of each McCormick rasp bar. Each stud is welded in a split-second. Complete cycle, which includes loading studs into the welding guns, positioning the work and welding takes less than 40 seconds.

The ten studs used to fasten each rasp bar to the reinforcing bars on a combined rasp bar cylinder assembly are welded on production units at a rate of approximately 50 bars per hour. Five studs are welded at a time, after which the 6-foot bar is shifted by a simple locating mechanism to bring the other five points under the gun mounts. Guns are set up with a timing control to operate in series from a power unit.

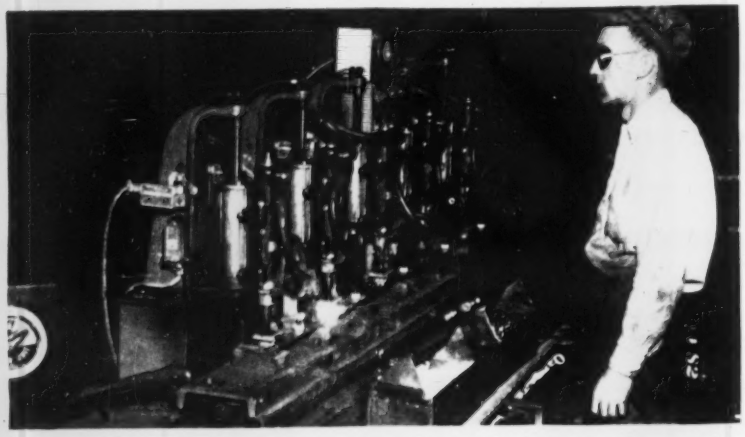
Eliminates Difficulties—The uniformity resulting from this controlled method of assembly has eliminated difficulties sometimes caused by variation in the teeth and the danger that bolts, which were made to conform with rasp bar contour face, would turn to positions that would interfere with smooth operation.

Dynamic balancing of rasp bar cylinder assemblies has been simplified. After quickly fastening bars to the cylinder, each is checked for straightness balance on a dynamic balancer at speeds up to 1050 rpm.

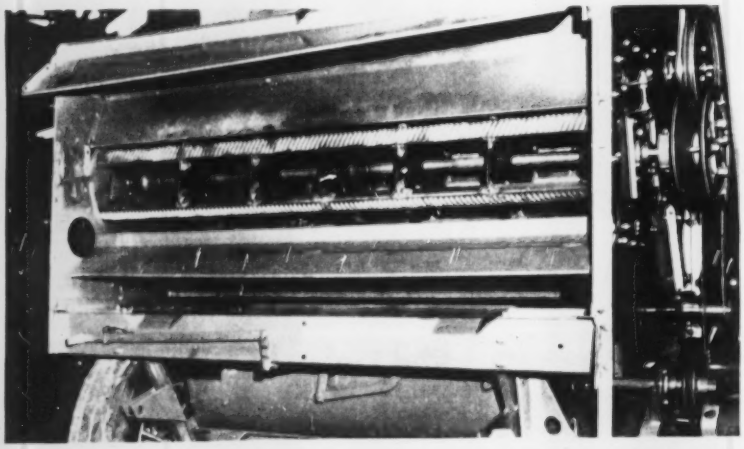
Cost Savings—Some implement manufacturers using both single-gun and multiple gun Nelson production units on rasp bars credit stud welding with dollar savings ranging from 75 cents to $1.54 per combine cylinder assembly. They report that shop balancing and tooth pitch problems have been materially reduced or eliminated.

One manufacturer, who uses eight studs per bar, and a multiple gun unit, reports an average production of 400 rasp bars per man day, as compared with a former rate of 100 per man day when the rasps were hand-welded to the reinforcing bars.

Farm operators using stud welded models can replace rasps in the field and know that the assembly will be balanced properly. Difficulties in controlling the distribution of weight in hand-welded replacement bars and backup plates made this practice almost impossible in the past.



A typical 5-gun production unit for welding studs to rasp bars. Cycle including loading studs into guns, indexing and welding takes 40 seconds



Closeup of harvester-thresher with cover plate removed shows stud-welded rasp bars on a finished machine. The worn bars can be quickly replaced

these Pennsylvania Transformers are cooled with Ross Exchangers

● This bank of three 29,000 Kva, 230,000-volt transformers is typical of many such high voltage power units which Pennsylvania Transformer Company, Canonsburg, Pa. furnishes to major industries and electric utilities.

To prevent transformer oil from reaching excessive temperatures, through heat generated in normal operation, each of these Pennsylvania units is equipped with two Ross Exchangers. Utilizing water as a coolant, their function is to receive the hot oil from the transformer, cool it as required, and return it for its job of maintaining the transformer temperature in accordance with NEMA guarantees.

Why have Pennsylvania's engineers selected Ross Exchangers for these applications? Among other things: "Ross equipment has many excellent features and the Ross organization has a fine background of manufacturing experience...has been very cooperative with us in connection with our heat exchanger problems".

The desire and competence of Ross engineers to consult in the solution of any heat exchange problem ...plus the wide adaptability of Ross fully standardized, pre-engineered designs and sizes, have earned a preference for Ross Exchangers in practically every field of application: engines, compressors, turbines, speed changers, hydraulic machinery and numerous others.

To be familiar with the principal Ross benefits, make sure you have the latest Ross literature. Request Bulletin 2.1K1 for information on the removable tube bundle Type CP Exchangers used on Pennsylvania Transformers, or Bulletin 1.1K5 on all-copper and copper alloy Type BCF units. Write.

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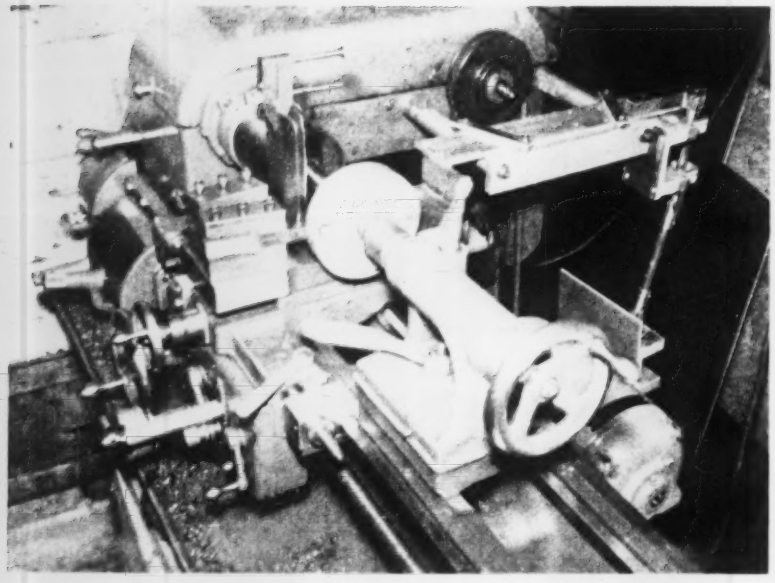

FACING AT 1000 SFM WITH TRIANGULAR INSERTS
drive varies from 100 rpm at 4 inches to 4000 at 1 inch

Expendable Tungsten Carbide Triples Insert Life

EXTENDED tool life, with good surface finish, is reported by a communications and recording equipment manufacturer in machining SAE C-1118 steel at 1000 sfm using Kendex expendable tungsten carbide triangular inserts. The operation performed by McElroy Mfg. Corp., Littleton, Mass., consists of facing two surfaces of a high-frequency transmitter component from a maximum 4 inches diameter down to 1-inch diameter center shaft.

Work is done on a $\frac{3}{4}$-hp Logan lathe having variable drive attachment. Machine surface must have a mirror-like finish because it is later plated with an 0.0002-inch thickness of copper followed by an 0.0012-inch silver application. The surface is then buffed down and rhodium flashed to prevent tarnish.

Variable Drive—To get the necessary machine finish, a surface-foot rate of 1000 is maintained throughout the cut. This is accomplished by varying the revolutions per minute from 1000 at the start to about 4000 at the finish of the cut with the lathe's variable drive unit. This drive is actuated by the tool slide, which is fed in at 0.0045-inch per revolution. Chip guard assures that finish machined surface will not be scratched.

At a lower foot rate, a satisfactory finish could not be obtained; at higher speed, tool life became a problem. The company reports the best tool life it received with several previous triangular insert grades was 20 pieces per cutting edge, or 60 pieces per insert.

Interchangeable Inserts — With K8 inserts Kennametal's most abrasive grade 180 pieces are faced, 60 with each of the three available cutting edges. Since depth of cut is only 0.007-inch, the left and right-hand tool inserts are interchanged to machine an additional 180 pieces to build the total faced to 360.

Talks Treat Foundry Safety

A two-day institute on foundry safety and health protection will be held at University of Wisconsion Mar. 24-25. The institute is sponsored jointly by the university's department of mining and metallurgy, the university extension division's engineering section, state board of health, industrial commission and American Foundrymen's Society.

Furnace Softens Scale

Lithium atmosphere annealing eases cleaning problems on the cast crankshafts at Ford

REMOVING foundry scale from castings at Ford Motor Co. of Canada Ltd. was resolved into a question of whether to clean crankshafts before annealing or after and both procedures were regarded too costly with existing facilities. In the former case, normalizing scale had to be cleaned after annealing, in the latter, the double scale required extra long cleaning.

To overcome these conditions, Ford decided to adopt a heating method that would reduce thickness and toughness of the scale on the casting surface. This was achieved by introducing a lithium atmosphere into the furnace.

Required No Changes—Without changing existing furnace design or construction, two standard Lithium Co. vaporizers were attached to each side of the direct fired furnace. Vaporizers are small refractory lined chambers that are gas-fired and can be fitted to any furnace. Running through the middle of the chamber is a rectangular refractory tube in which rests a boat of Lithium compound.

When the chamber is heated, the compound is vaporized and vapor picked up by the products of combustion which enter the tube and are carried into the furnace. The vapor is said not only to inhibit additional oxide formation on the castings but also tends to change the character of scale that was on the metal when it was put into the furnace. It becomes relatively soft, thin and flaky.

Added Advantage It was also discovered that the atmosphere, permeating the furnace chamber to form a coating on the crankshafts, covers alloy parts such as furnace rails, trays and other fixtures in the furnace or which pass repeatedly through it. This coating inhibits normal oxide attack, and increases furnace life a reported 50 per cent.

The company reports that the castings themselves are in much better condition for cleaning. The operation now requires only five to eight passes on the blast table instead of 12 to 15 needed before.

Pouring the Roll

WHERE EXPERIENCE COUNTS . . . for you

The critical step in roll making occurs in the pouring. Here, the experience and metallurgical knowledge of the roll maker determines the quality of the roll and its performance on your stands.

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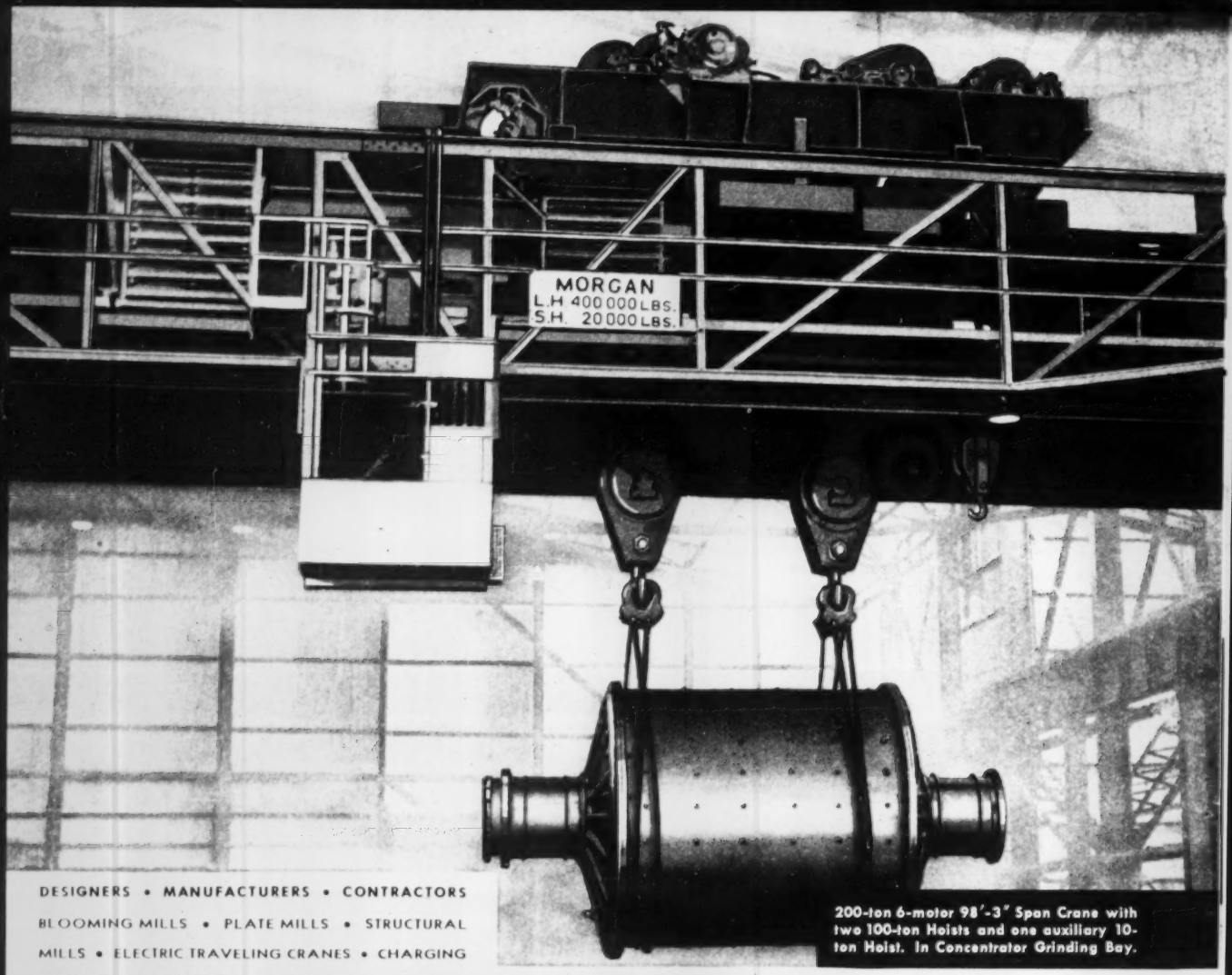

200-ton 6-motor 98'-3" Span Crane with two 100-ton Hoists and one auxiliary 10-ton Hoist. In Concentrator Grinding Bay.

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MORGAN CRANES AT "CHUQUI"

Illustrated are three Morgan Heavy Duty Mill Type Cranes at Chile Exploration Company's new plant at Chuquicamata. These cranes are of very rugged construction, especially designed for copper smelter service. *Your inquiries will be appreciated.*

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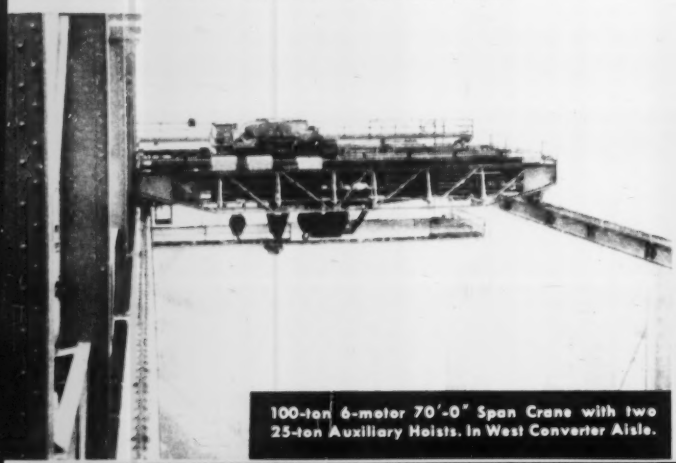
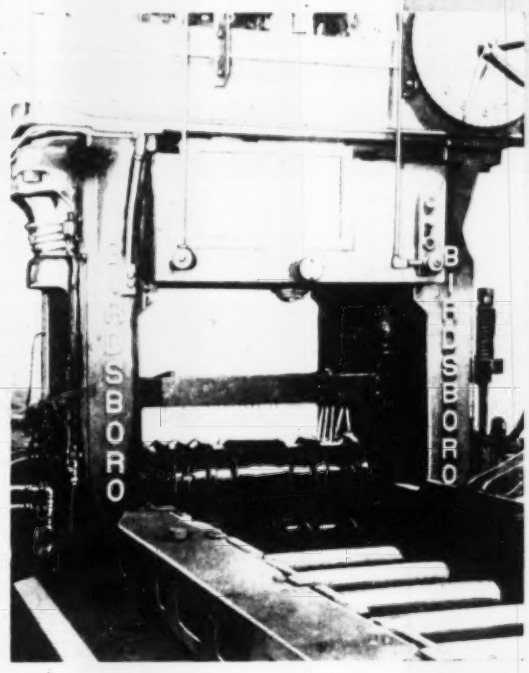
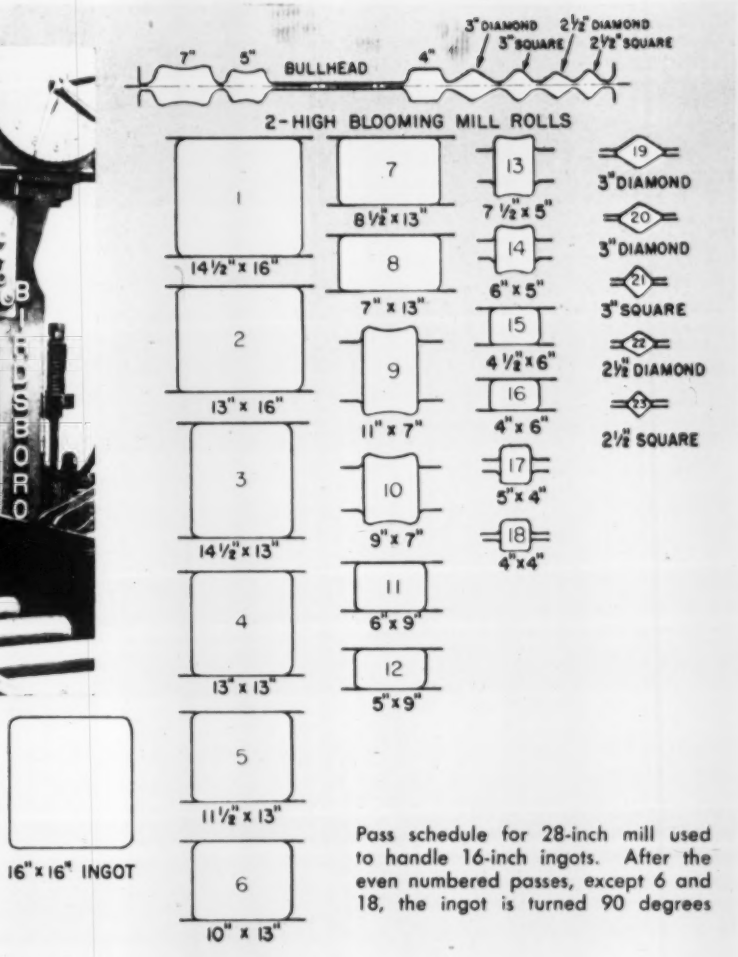


100-ton 6-motor 70'-0" Span Crane with two 25-ton Auxiliary Hoists. In West Converter Aisle.

100-ton 6-motor 70'-0" Span Crane with two 25-ton Auxiliary Hoists. In East Converter Aisle.



Typical of small 2-high reversing mills installed in recent years by specialty steelmakers is this 22-inch unit installed at Watervliet, N. Y.



Pass schedule for 28-inch mill used to handle 16-inch ingots. After the even numbered passes, except 6 and 18, the ingot is turned 90 degrees

Small 2-High Reversing Mills Gain Favor

Lower production costs and greater operating flexibility are principal reasons why specialty steelmakers are shifting from former methods employed

By E. C. PETERSON
Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pa.

MODERN small 2-high reversing mills for the rolling of semifinished specialty steel products are becoming increasingly popular. These small mills are usually in the 18 to 28-inch size range and their increasing use may be explained by two factors: A tendency to adopt larger ingots of high alloy, stainless and tool steels to the point where conventionally used 3-high mill and forging hammer or press is uneconomical to operate; increasing versatility and flexibility of manipulation and reduction of manual labor are features built into the modern small 2-high reversing mills.

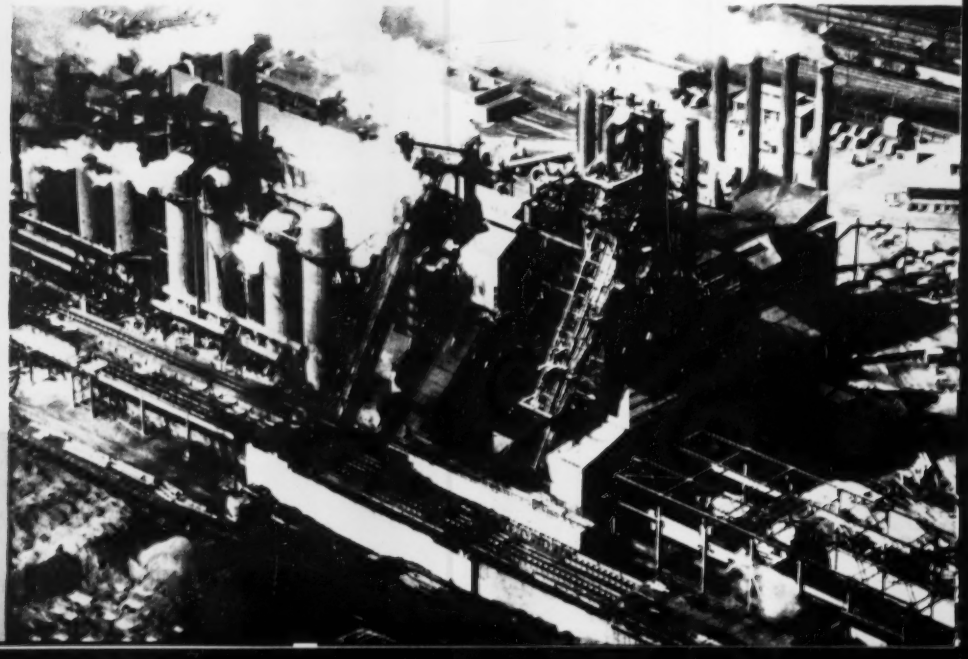
Most of these mills have water lubricated neck bearings of segmental block design. One recent mill has roller neck bearings to provide ease and accuracy of alignment of roll grooves plus freedom from eventual misalignment due to thermal expansion and wearing of the end thrust collars, as experienced with water lubricated bearings.

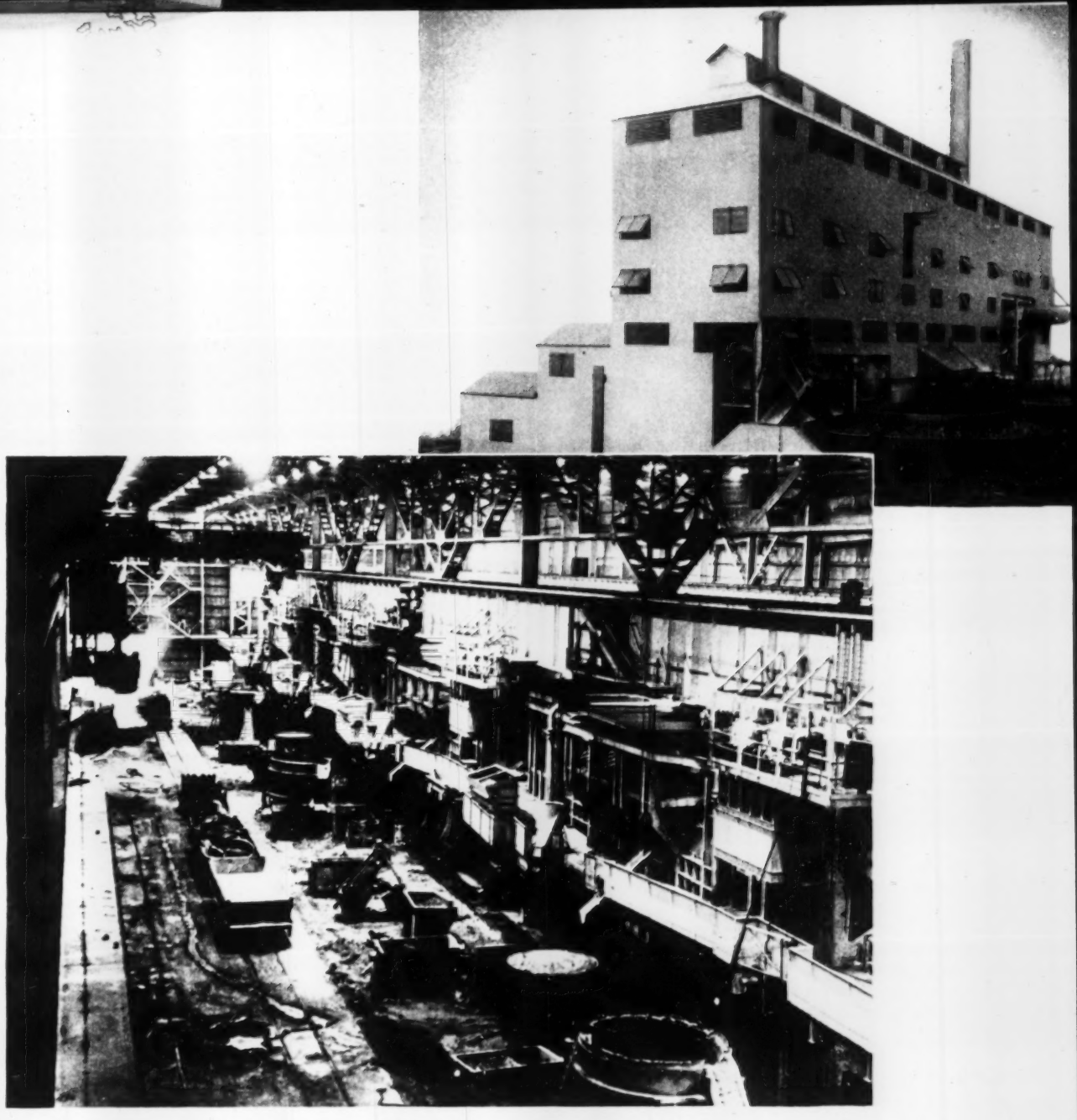
Close Settings—Screwdown motors are arranged for series or parallel magnetic control to obtain two speeds, or with variable voltage control. On these small mills it is practical for the operator to set the roll parting to one-half of 1/64-inch increments. Mechanical top roll counter-balance is preferred because of the simplicity of its operation and ease of maintenance.

A recent improvement in the lubrication of the universal spindles consists of an oil reservoir with appropriate feed line and metering

IN almost every country in the world and every state in the union where steel is produced or petroleum is refined you'll find McKee engineering. Every year sees an increase in the number and size of projects designed and constructed by McKee . . . new names added to the list of countries in which McKee has executed contracts.

The reason for this steady growth lies in the excellence of McKee engineering, the soundness of McKee construction and the close coordination of these functions with expeditious purchasing services. That's why steel men and oil men from all over the world come to McKee again and again for *engineering that means assured results.*





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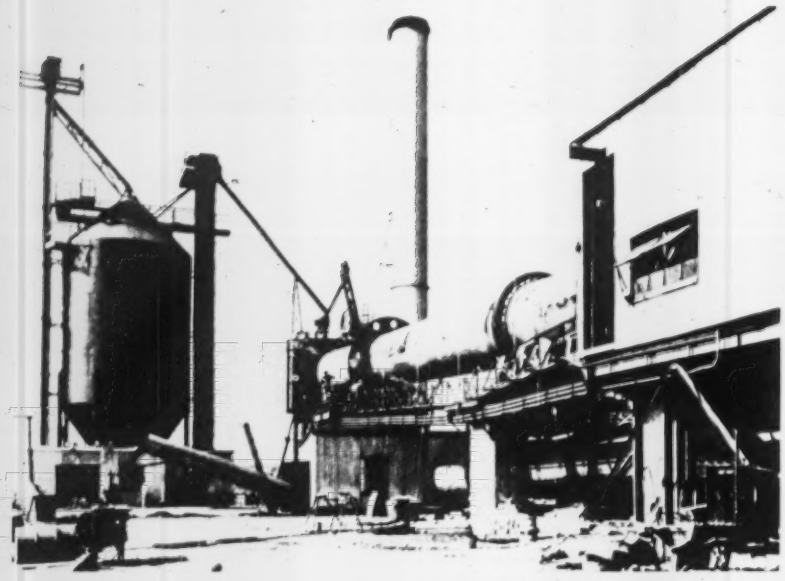

New Calcinator Ups Coke Supply for Electrodes

Rotary calcinator installed at its Niagara Falls, N. Y., plant means an increased supply of calcined coke for production of graphitized carbon electrodes at International Graphite & Electrode Division, Speer Carbon Co. The coke will be used in manufacture of electrodes and anodes, and to supplement the raw material supply the firm uses for motor brushes and other specialties

valve to provide a steady supply of oil to the slippers.

Alloy steel is the usual material used in the rolls but iron is required occasionally for better surface conditions. In this case a removable steel spade is keyed to the end of the roll to provide sufficient strength in this highly loaded section. With a duplex changing rig, roll can be changed in 30 minutes.

Planned for Production — Front and back mill tables have close roll spacing to accommodate the relatively short ingots handled. Self-aligning bearings are used on roller journals to provide relief from the effect of roll warpage when the ingot heats a roll unevenly, as during a mill delay. Individual feed roll drive is used and two recent installations incorporated slip clutches in the floating shaft spindle which drives the feed roll, in order to minimize the shock which occurs when a piece leaving the rolls is driven against this roller.

A nest of rollers underneath the mill table carries the manipulator rams, and these rollers are journaled on antifriction bearings to minimize friction and permit rapid acceleration of the side guards. Finger lift motor and reduction unit can be mounted directly on the side guard. This makes a simple mechanical arrangement and does not slow down the side guard appreciably. The finger lift has a mechanical adjustment so that different lengths of stroke can be obtained. A recent installation accomplishes this end electrically, so that the stroke can be varied to suit the size of product being handled by turning a selector switch in the operator's pulpit. This is a helpful feature when a wide range of sizes is to be handled, since no single stroke will function properly for all of these sizes.

Since the conventional unit for producing semifinished products in the specialty steel industry has been the 3-high mill, the following are some of the advantages of the 2-high reversing mill as compared with the 3-high mill.

Bigger Ingots—First, relatively little work can be done in one fixed pass stand. The rolls are cut so deep that very little life is obtained, and breakage is always a problem. A 14-inch square ingot is reduced to a $6\frac{3}{4}$-inch square in a typical 28-inch 3-high mill. By contrast, an 18-inch square ingot is reduced to a 4-inch square in the rolls of a typical 26-inch 2-high mill.

Second, variable speed is an inherent characteristic of the 2-high mill and this factor is extremely important in handling specialty steels for the following reasons:

1. Spread may be controlled by varying the rolling speed. Since the spreading characteristics vary considerably from one grade of steel to another, a given series of reductions can be used successfully with different grades and different speeds. With a constant speed drive, such as is usually found on a 3-high mill, difficulty is encountered with underfilling and overfilling as grade and temperature are changed.

2. Difficulty in entering hard or slippery grades can be overcome by entering at low speed.

3. Production can be maximized by taking initial passes at low speed, where entry is difficult, and speeding up on the final long passes.

4. Slow speeds can be used to avoid rupturing the surface of tender grade ingots, until sufficient work has been done to permit faster rolling.

Makes Big Difference—Third, the mechanical screwdown of the 2-high mill gives the following advantages:

1. Only with the screwdown can the variations in reduction schedule required by different grades of steel be made without delay.

2. Different size ingots must be rolled and numerous different sizes of semifinished products produced, usually in small orders. The screwdown again provides the only practical method to make these size changes without delay.

3. The screwdown helps to make roll changing less complicated and less time-consuming on the 2-high mill, and permits the use of rigid, closed housings.

4. Specialty grades of steel are apt to develop split ends during rolling. By the skillful use of the screwdown, manipulator and reversing motor, the operator can save pieces that could not be entered into a fixed pass mill. Other accidents in rolling, such as partial turn-downs, can often be corrected by stopping the mill quickly and working the bar into rolling condi-

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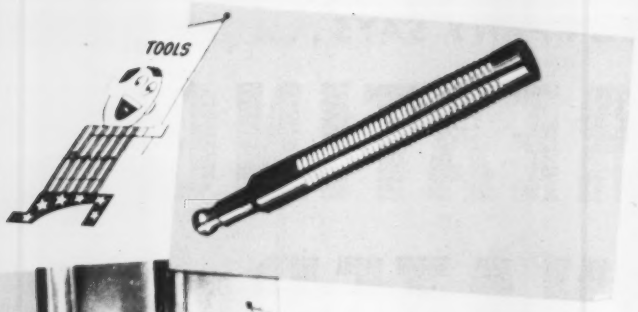

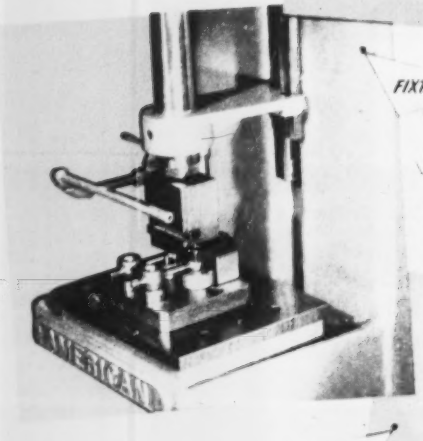

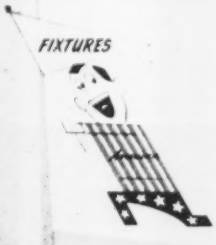

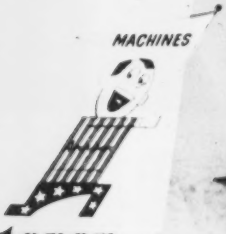

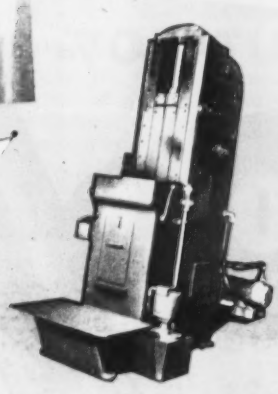

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Maximum Ingot Size Capacity of Small Mills With Mechanical Screwdown and Fixed Passes

Mill size, in.	Maximum square ingot handled, in. Mills with mechanical screwdown	Mills with fixed passes
32		16
30		15
28	22	14
26	20	13
24	18	12
22	16	11
20	14	10
18	12	9

tion again, an impossibility on a 3-high mill.

5. A mill without a screwdown is virtually useless for the production of slabs, since the edging grooves weaken the rolls excessively. With a screwdown relatively shallow edging grooves can be used and wide slabs produced.

Deformation Disappears — Fourth, the straight entry into the passes of a 2-high reversing mill eliminates improper deformation of the steel and punishment of the table rollers, as occurs on the 3-high mill with tilting tables, where both entry and delivery are at an angle.

Further, stroke of the tilting table is constant, and it can never be adjusted properly to the roll passes, but must be a compromise with the varying diameters of the middle roll, and the different groove depths.

Fifth, the side guard manipulator with finger lift, as used on the 2-high mill, is the most flexible manipulating arrangement yet devised. Three-high mills with tilting tables often use fingers located between the tilting table rolls to turn over and manipulate. These arrangements are inflexible, however, and limit the roll designer and operator in their choice of rolling schedule, a very serious drawback in handling specialty steels.

A sixth advantage of the 2-high mill for rolling specialty steels is the relatively small roll required to handle a given ingot size. This condition permits it to finish a much smaller billet satisfactorily by reducing speed.

Seventh, the construction of the 3-high mill causes the passes to spring more under load, which is a disadvantage if a close tolerance is required on the billet.

Savings Significant — It is not economically practical to use a plain 3-high stand for cogging ex-

Look around the coffee shop

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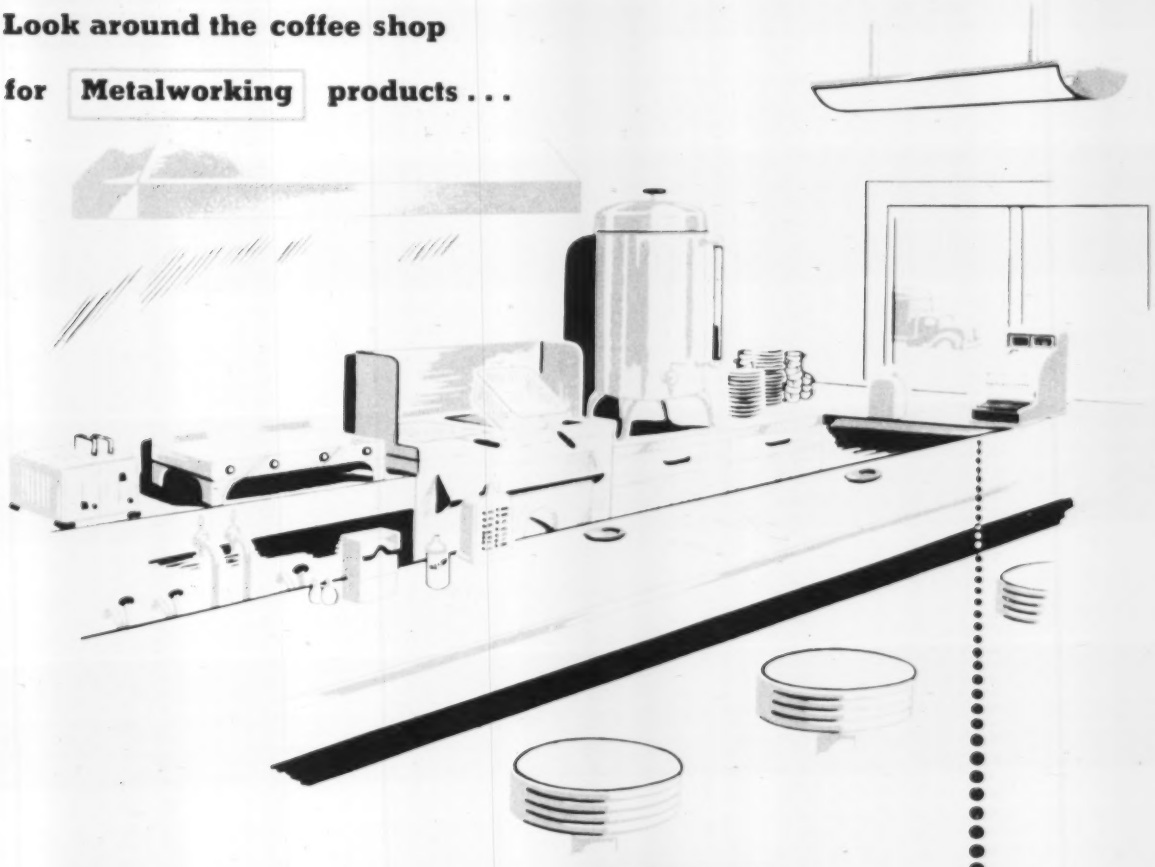

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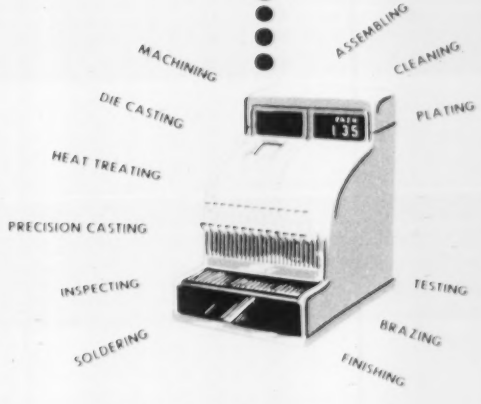

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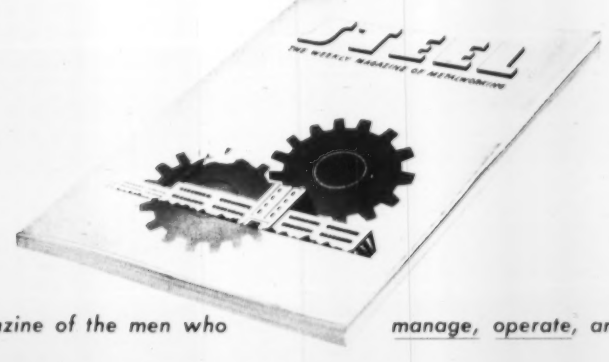
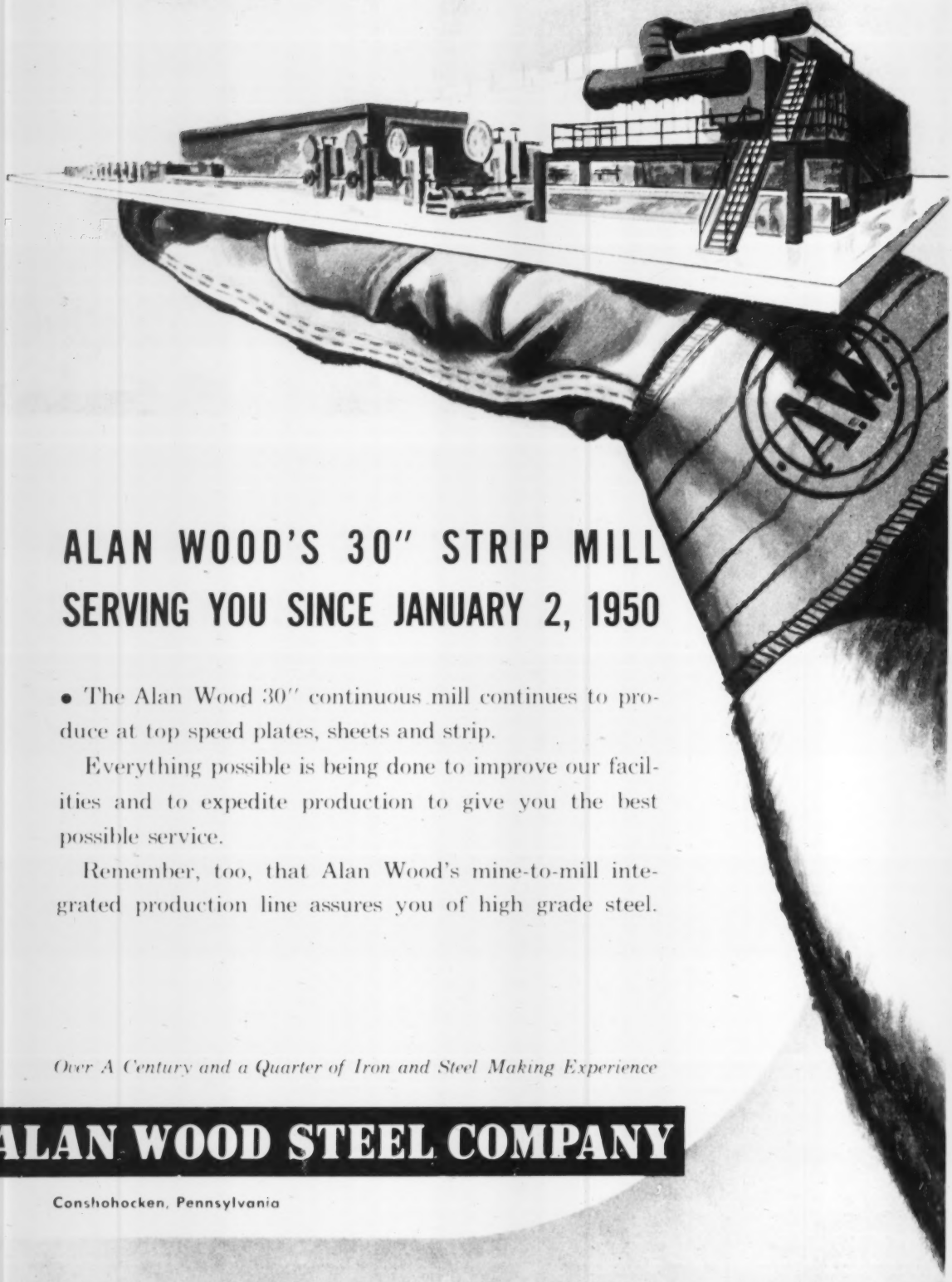


The magazine of the men who manage, operate, and buy for the metalworking industry



ALAN WOOD'S 30" STRIP MILL SERVING YOU SINCE JANUARY 2, 1950

• The Alan Wood 30" continuous mill continues to produce at top speed plates, sheets and strip.

Everything possible is being done to improve our facilities and to expedite production to give you the best possible service.

Remember, too, that Alan Wood's mine-to-mill integrated production line assures you of high grade steel.

Over A Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

Conshohocken, Pennsylvania

IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N. J. • OXFORD, N. J.

cept in those cases where very small tonnages of high cost alloys are being produced.

Experience shows that with high alloy steels, a conversion cost from ingot to semifinished products of 3 cents a pound can be reduced to 1 cent by changing from a simple 3-high mill with mechanical equipment to a modern 2-high reversing mill, and this does not make any allowance for the additional savings in the steel plant and in yield due to the possible use of larger ingots.

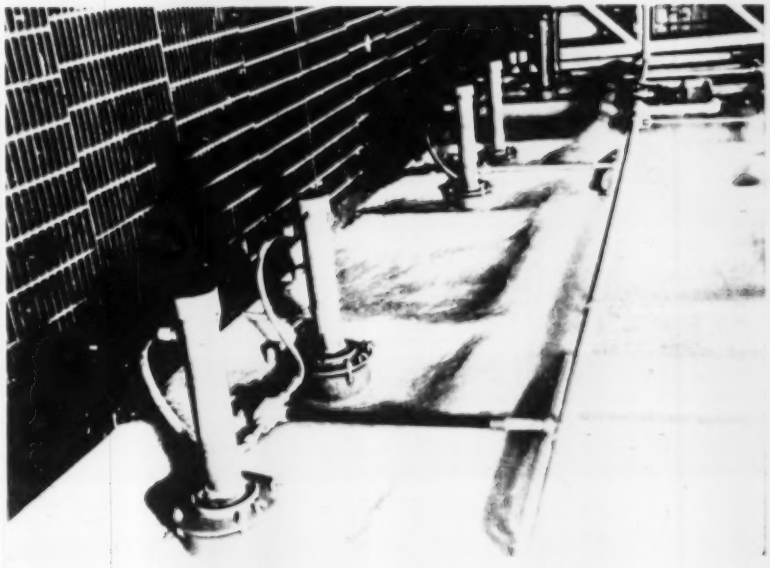
Various features can be added to the 3-high mill. These include: Direct current variable speed drive, tilting tables, side guard manipulator with finger lift, and top and bottom motor driven screwdown or top motor driven screwdown and floating middle roll.

Other Factors—While the reversing mill will do everything that the 3-high mill will do in reducing specialty steel ingots, and will do much of it better than the 3-high mill from a quality standpoint, the same cannot be said with regard to the forging process.

Two steel-producing plants that recently installed reversing mills have found that about 95 per cent of their specialty grades can be roll cogged, and at a lower cost than by forging. Nevertheless, forging will always have a place in the cogging operation because of the peculiar properties of some of the special alloys.

The 3-high mill of simple design has such serious drawbacks for quality and flexibility of production and cost of operation as to make it impractical for a modern installation.

When it is doctored up with mechanical devices to eliminate labor and add flexibility, it is worthy of consideration only when driven by alternating current constant speed equipment. Progressive mill operators in the specialty steel business are fast coming to realize that variable speed drive on their mills is a necessity for quality and improved production. When direct current drive is added to the mechanical cost of the complicated modern 3-high installation, with screwdowns, tilting tables and side guard manipulators, its cost equals that of the simpler and more effective 2-high reversing mill.



Six magnetic impulse rappers are shown in this installation. Up to 24 of these units can be energized in a 60-second cycle from one power source

Continuous Rapping Bars Dust Buildup

Remote-controlled solenoid-actuated magnetic impulse system cleans precipitators in 60-second cycle. Dust clouds disappear as batch cleaning is eliminated

DEVELOPMENT by Research Corp., Bound Brook, N. J., offers electronic precipitator users a rapping system for continuous electrode cleaning. The company's magnetic-impulse (MI) method delivers continuous impacts of light and easily controlled intensities.

The system employs a solenoid-actuated rapper energized by a pulse generator. According to Research Corp., it can be installed easily on any standard precipitator used in electric, blast, open hearth and iron ore sintering furnace installations. Applications extend to fly ash and gypsum.

Dust Buildup—Of the two banks of electrodes that accomplish material recovery in precipitator operation, one discharges an electrical field that ionizes dust suspended in the gas; the other collects dust for disposal. However, all collected dust does not fall by gravity into disposal hoppers. Instead, a certain portion builds up into appreciable layers, particularly on the electrodes, affecting efficiency of equipment.

Unloading these accumulations with standard pneumatic or mechanical rapping devices previously was limited to an intermittent operation. Result, says the company, is batch removal rather than continuous cleaning that keeps efficiency at high level. In addition, continuous rapping means size of unloaded dust aggregates is kept small enough at all times to prevent clouding dust disturbances in the equipment.

Remote Control—A central remote control generator can deliver tripping impulses to each rapping unit up to 24 per precipitator at 2½-second intervals. The entire precipitator is rapped in 60 seconds or less. Power consumption rates about 300 w per precipitator. A separate remote control permits rapper monitoring from any convenient plant location to eliminate need for regular operating personnel.

To hold down maintenance, the only major moving part is hermetically sealed and permanently lubricated at time of manufacture.

A name to Remember

The next time you're taking estimates on new presses let the Warco representative in your area give you the facts that have caused more people to buy Warco Presses the past year than ever before.

A few minutes with a Warco representative is all you'll need to see why the added quality designed and built into Warco Presses guarantee extra life at lower maintenance costs. You'll be introduced to many features, exclusive with Warco, that spell added safety, less operator fatigue and greater press speeds.

Too, your Warco representative is a specialist who'll work with you in getting a press that will do the most efficient job per dollar invested. And, you'll appreciate, like hundreds of others, the johnny-on-the-spot after sale service for which Warco representatives are noted.

So, next time you think of presses be sure you have the Warco story — it will pay you in the long run. Warco representatives located in all principal cities.

Federal® WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco PRESSES®

Rappers for both discharge and collecting electrodes can be energized by a simple arrangement from one common supply source.

How It Works—The MI rapping case, containing its solenoid-actuated plunger and elements, is welded to the end of a horizontal rapper bar protruding through the precipitator wall and stuffing box. Horizontal rapper is welded along the edges of collecting plate electrode banks. Each bank is rapped in sequence.

Power supply for the MI units takes 115 v, single-phase 60-cycle current to the pulse generator. The latter includes a transformer for stepping up alternating current and a full wave rectifier for converting alternating current to direct current.

Current then flows through charging resistor and condensor where energy is stored. Pulse energy to individual solenoid rapper coils flows through the motor-driven distributor switch, which puts each unit consecutively in line to receive pulse energy released by the storage condensor.

Watts Keep Diesels Warm

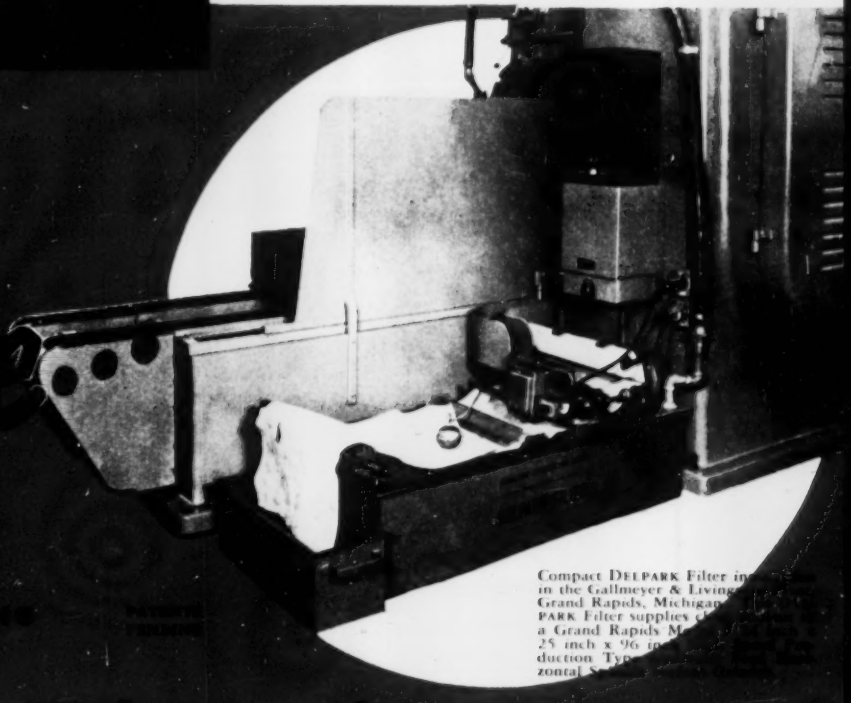
Diesel engines used in cranes, switch engines, trucks and other outdoor equipment can be kept ready to operate in the coldest weather safely and automatically with electric heat. A few kilowatt-hours of electricity can save many man and equipment hours ordinarily lost waiting for engines to warm up.

To illustrate, Edwin L. Wiegand Co. cites an installation where three cranes and a switching engine at Buffalo Slag Co., Lackawanna, N. Y., are heated economically and efficiently with Chromalox electric circulation heaters attached to the engine block with angle iron. With flexible connections to the cooling system, regular types of antifreeze are circulated by natural convection through the heater and engine block, warming the engine in a short time. Special pumps are not required.

The electric circulation heater is a completely packaged unit with built-in elements, heating chamber, thermostat, and threaded inlet and outlet. On average winter morn-

Delpark

Self-Cleaning INDUSTRIAL FILTERS...



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First Choice

OF OUTSTANDING

Machine Tool Manufacturers!

In their shops as well as on the equipment they sell, DELPARK Filters are the major choice by outstanding manufacturers of machine tools for the filtration of coolants. The reasons are obvious when you know the finer points of DELPARK Filtration.

The DELPARK Filter is a gravity filter, it does not filter by *expensive forced methods*. DELPARK filtration is natural filtration, making use not only of the filter media but employing the swarf deposited on the belt as additional filter material.

The DELPARK Filter is full flow, continuous, self-cleaning and fully automatic. It supplies clean coolant to the grinding wheel at much lower and more uniform temperature due to removal of the heat bearing solids. Clean coolant also eliminates dermatitis and reduces loss of man hours.

Greater savings are achieved through longer wheel life, less wheel dressing, the elimination of down-time for desludging the reservoir, reduced pump wear and system maintenance, and fewer rejections on the production line.

For the finest in Filtration . . . See DELPARK, the *Original* Automatically Self-Cleaning Industrial Filter.

Delpark

INDUSTRIAL FILTRATION

Filters That Amortize Themselves Within a Year

INDUSTRIAL FILTRATION COMPANY
29 Industrial Avenue, Lebanon, Indiana

Gentlemen: We would appreciate having more information on the Famous DELPARK Industrial Filters applied to coolants.

Name ..... *Title* .....

Company .....

Address .....

City ..... *State* .....

A man with a hate

● There's no halfway feeling about fire and its resulting destruction with an expert fire protection engineer... he actually hates to see a little fire roar into a raging inferno and create a sizeable loss.

This personal sense of responsibility is inherent with C-O-TWO Fire Protection Engineers... a definite plus in your behalf. Whether its fire detecting or fire extinguishing ...portables or built-in systems... C-O-TWO means top quality backed by experienced engineering that results in operating superiority for you at all times.

With C-O-TWO Fire Protection Equipment, simplicity, practicability, longevity and minimum maintenance are built-in features that guarantee fast, positive action the instant fire strikes. Furthermore, extensive manufacturing and field installation skills, together with approvals such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Armed Forces and Government Bureaus assure you of the finest in modern fire protection equipment.

Rushed production periods and future expansions are some of the many problems carefully considered in a plant-wide firesafety recommendation by C-O-TWO Fire Protection Engineers... the prime objective always being the best type fire protection equipment for the particular fire hazard concerned.

WHEN BUSINESS STOPS . . . INCOME STOPS!

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today... our extensive experience over the years is at your disposal without obligation. Get the facts now!

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MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
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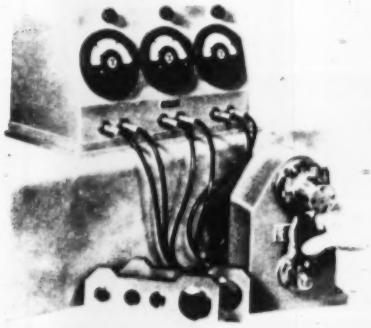
ings, a 150 F setting is sufficient to heat most engines in 30 minutes. In colder weather, the heaters may be operated all night at 90 F.

Computing Air Gage

Where more than one variable has an effect on the reading, this gage reduces your figuring

ORIGINAL application of air gaging was made for checking internal and external diameters. As its advantages became more apparent, it was applied to multiple and complex measuring problems such as checking tapered cylindrical parts, center distances, squareness between face and bore and concentricity.

When the air gage is used for one of these measuring problems,



HUMAN ELEMENT
. . . the gage cuts it down

the setup is complicated by the fact that there is always more than one variable involved, since readings are not only affected by variation of the above factors, but also by variations in diameter. The total effect of both variables must be considered in arriving at the final result. It is necessary therefore to use at least two air circuits and a like number of indicators to arrive at the desired result.

Paper Work—Operator frequently has to take readings from two air indicators, then add or subtract the respective readings before the final answer can be obtained. This computation is required when checking tapered parts, center distances between holes and clearances between mating parts.

When checking concentricity between diameters or squareness of bore to face, it is usually not necessary to obtain results from sepa-

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IRIDITE®
FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide
corrosion resistance
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And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating

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combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

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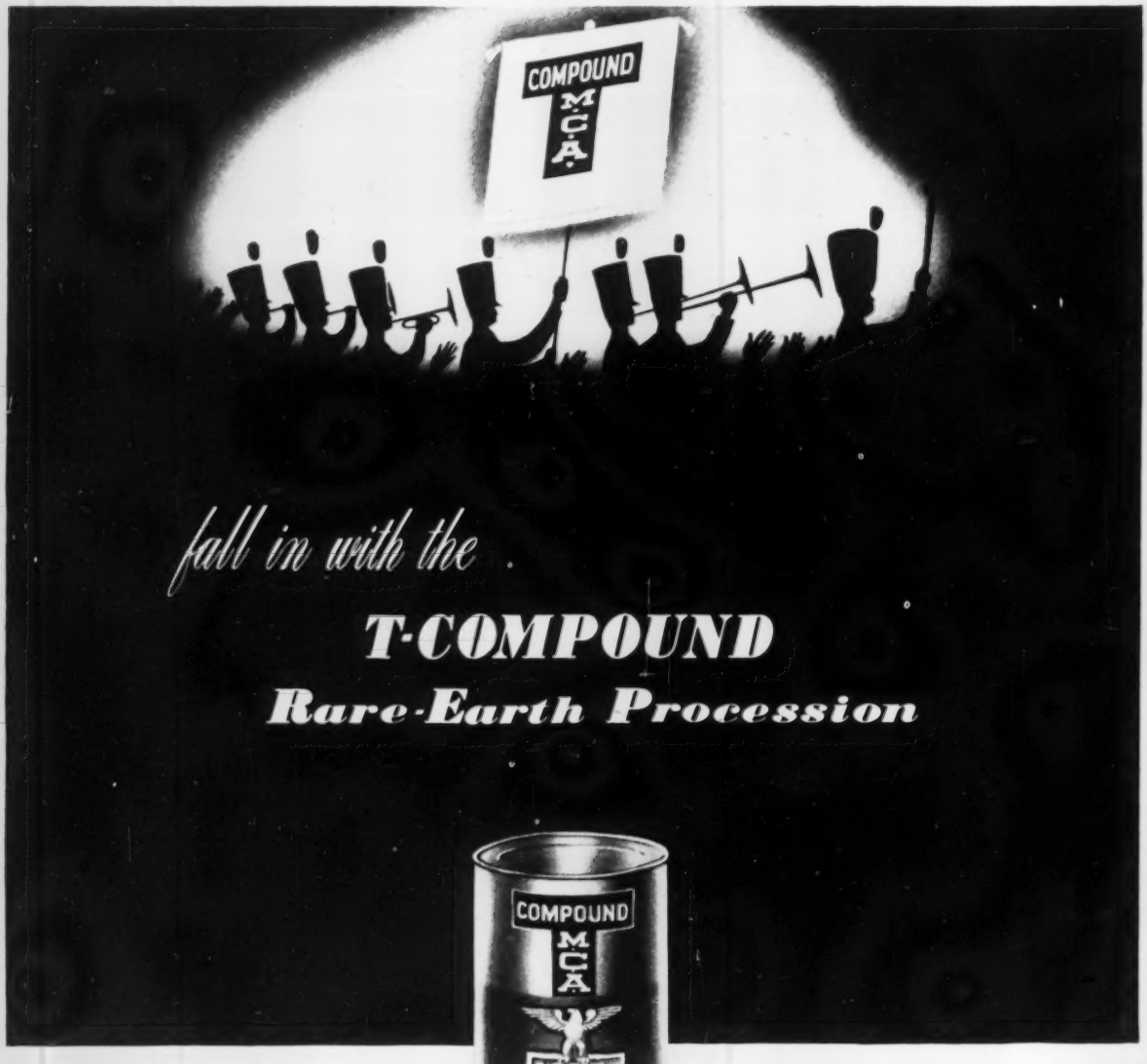


Castings for today and tomorrow need constant improvement. A new help is now offered. Use of Rare Earth materials yields better, definitely uniform physical properties, and gives added assurance of meeting specifications.

A special product, "Rare-Met" T-Compound, developed by the Molybdenum Corporation, is most convenient and most thoroughly approved for use in both steel and nodular iron.

Having its own huge rare-earth deposits, the Molybdenum Corporation has devoted special research to these materials and can give advice on a wide variety of applications. You may wish to investigate.

As a supplier of Molybdenum, Tungsten, Boron, and other alloying materials, the Molybdenum Corporation welcomes correspondence on any requirement.

AMERICAN Production, American Distribution, American Control, Completely Integrated

Offices: Pittsburgh, New York, Chicago, Cleveland, Detroit, Los Angeles, San Francisco

Sales Representatives: American Steel and Supply Co., Chicago; Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco

Subsidiaries: Cleveland-Tungsten, Inc., Cleveland, O.

Works: Washington, Pa.; York, Pa.

MOLYBDENUM

CORPORATION OF AMERICA
Grant Building Pittsburgh, Pa.

MCA

Controls at Sandvik

U.S. research equipment finds service around the world. Here, a technician at Sandvik Steel Works, Sandviken, Sweden, makes analyses with an x-ray diffraction and Geiger counter x-ray spectrometer installation supplied by North American Philips Co. Inc., Mt. Vernon, N. Y. The Swedish firm uses the equipment for both production control and development operations

rate indicators and then compute an answer. However, due to the usual permissible variation in diameter involved, position of the tolerance range on the scale will change if diameter varies from its mean value.

Margin of Error—According to the maker of the new gage, Taft-Peirce Mfg. Co., Woonsocket, R. I., when applying the standard type air gage circuit and indicator to these measuring problems, more responsibility is placed on the operator and the human element has not been entirely eliminated.

With the Taft-Peirce computing indicator, it is possible to remove the effect of one of the variables (diameter) on the results shown for value of taper, concentricity and clearance.

This is done by applying the diameter variation to both sides of the differential measuring device, thereby nullifying its effect on the reading obtained on the dial.

Thus it is possible to obtain readings for these dimensional characteristics on a single dial with a single pointer. This means greater speed, accuracy, convenience and economy.

the *tougher* the cutting job . . .
the *better* the opportunity for . . .

Abrasive Cutting

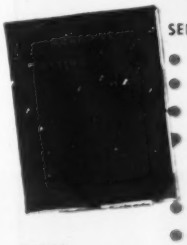
"FOR HEAVEN'S SAKE, SAWYER . . . HOW DID YOU GET INTO THIS FIX?"

Unusual cutting conditions like this are the exception . . . but whether you have a specialized application or a mass production job, you can depend on Allison Wheels. Whatever the material to be cut, there is an Allison Abrasive Cutting Wheel processed and formulated to fit the job. This means faster cutting with fewer rejects and reduced operating costs.

If you have a cutting problem, go to Allison — the specialist in abrasive cutting.

Allison ABRASIVE CUTTING WHEELS

THE *best* WAY TO CUT MANY MATERIALS
THE *only* WAY TO CUT SOME



SEND FOR THIS HELPFUL BOOK ON ABRASIVE CUTTING

THE ALLISON COMPANY
255 Island Brook Ave., Bridgeport 8, Conn.

Please send me your free booklet on Abrasive Cutting.

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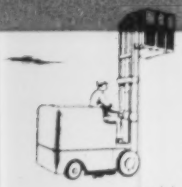
INSIDE AN EXIDE-IRONCLAD



Inside . . . where it counts most . . . EXIDE-IRONCLAD is entirely different than any other battery. It's made that way by EXIDE'S exclusive IRONCLAD slotted-tube construction . . . a principle that provides direct operating-hour savings for you.

OF ALL BATTERIES, ONLY EXIDE-IRONCLADS HAVE POWER TUBE POSITIVES

The positive plate is different . . . unique . . . exclusive. It is the most effective retainer of active material yet demonstrated in heavy duty service. Slotted tubes contain the active material. So fine are the slots that, while permitting easy access of electrolyte, they retard the active material from washing out, hold it during repeated cycles of charge-discharge, and the vibration of rough use.

Today's battery-powered equipment is being used harder than ever before. Unless the batteries have internal shock protection they tend to deteriorate under hard usage—both electrical and mechanical. Only Exide-Ironclad has the plus-protection of the tubular positive that can withstand today's more exacting and rigorous heavy-duty battery services.

Your EXIDE sales engineer will give you the factual inside story. See for yourself why *only* an EXIDE-IRONCLAD gives maximum day-after-day service under the most difficult operating conditions . . . *with a minimum of maintenance expense.*

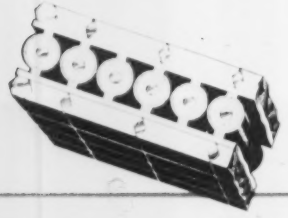
THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

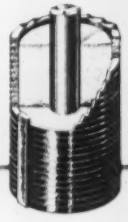
1888 . . . DEPENDABLE BATTERIES FOR 65 YEARS . . . 1953

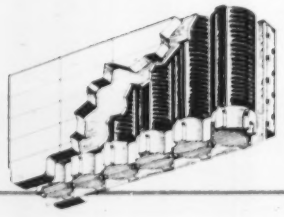
Cross section shows relation of positive plate to separators and negative plate. Note the much greater exposure of active material to electrolyte as compared with that of the usual flat positive plate. This greater exposure makes possible the high power ability and uniform-voltage characteristics of the Exide-Ironclad. The negative plates have been made extra heavy to balance the increased capacity of the power tube positives.

Running through center of each tube is an alloy core which is cast with the heavy top cross bar. These form the sturdy, non-buckling grid. Both core and top bar are made of Exide's new corrosion-resistant Silvium, an alloy of silver, lead and other components, which adds greatly to plate's long life.

New polyethylene insulating tube sealer of acid-proof, non-corroding plastic fits snugly into bottom of slotted tubes and further reduces loss of active material. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.



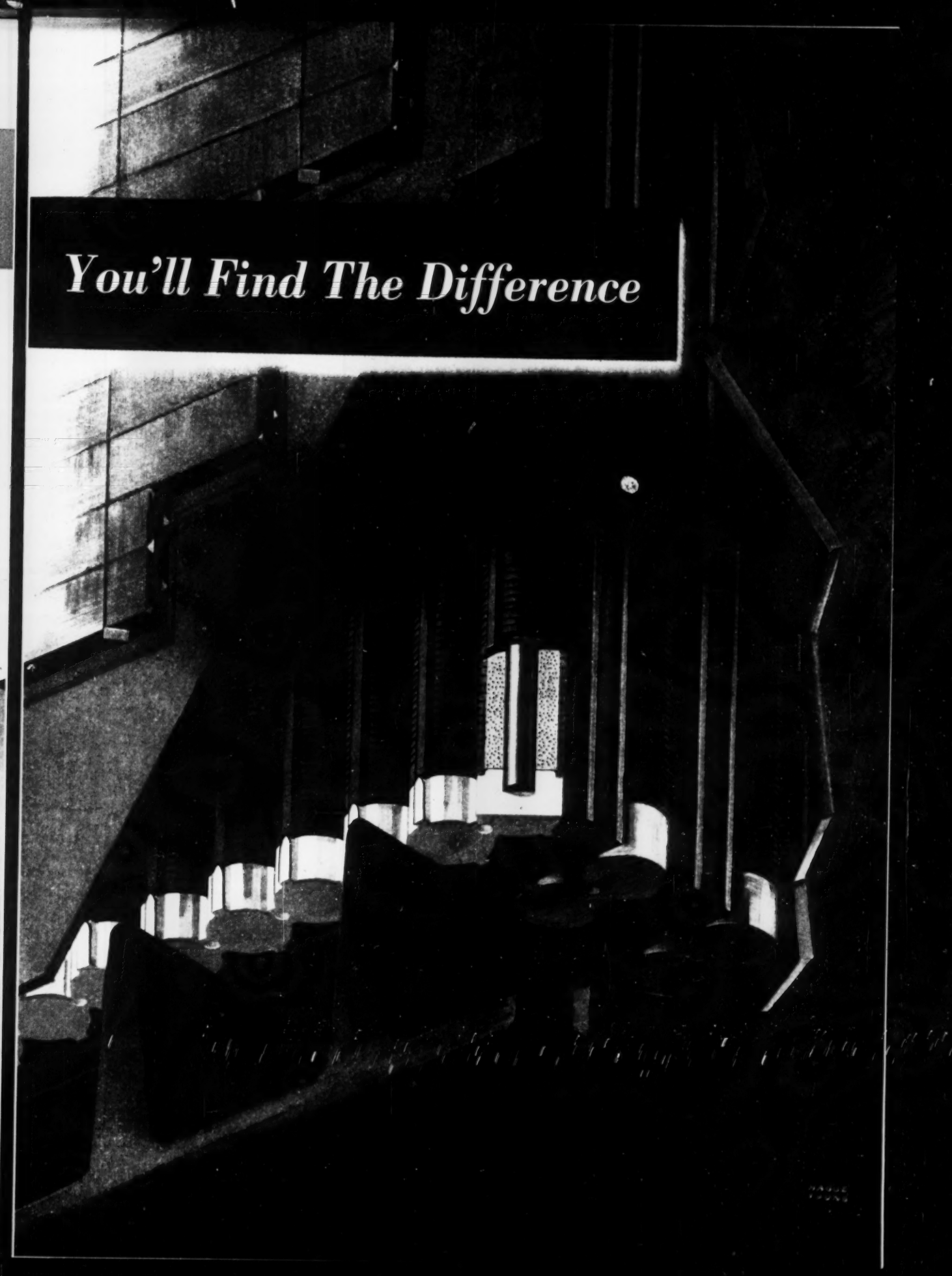




Exide-Ironclad

YOUR BEST POWER BUY . . . AT ANY PRICE

"Exide Ironclad" and "Silvium" Reg. T. M. U. S. Pat. Off.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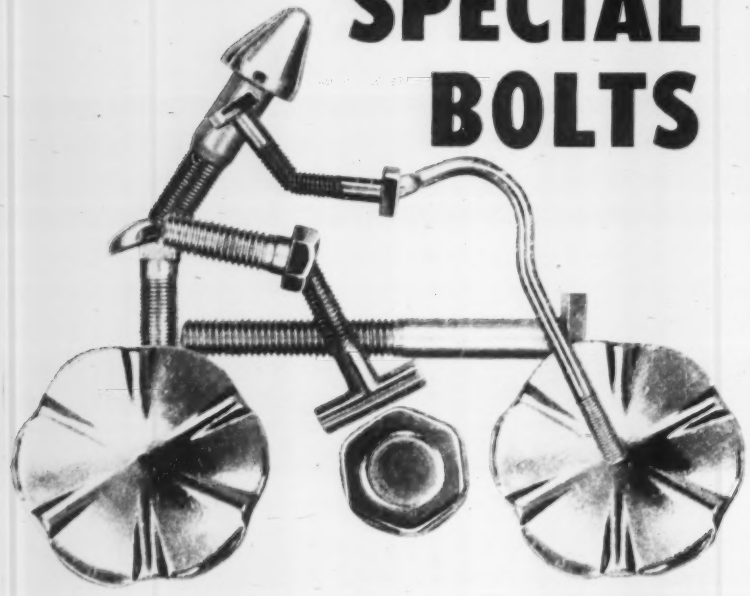
Build "Sales Features" into your Products with SPECIAL BOLTS



● Why limit the design of your products to ordinary fasteners? Special Circle Ⓑ bolts can often add sales appeal in improved design with greater strength. Equally important, you can figure on faster, easier assembly at lower unit cost. Call on our experience to gain plenty of practical advantages.

● In specifying and ordering standard fasteners, you will find our Catalog No. 51 very helpful. Write for your copy.

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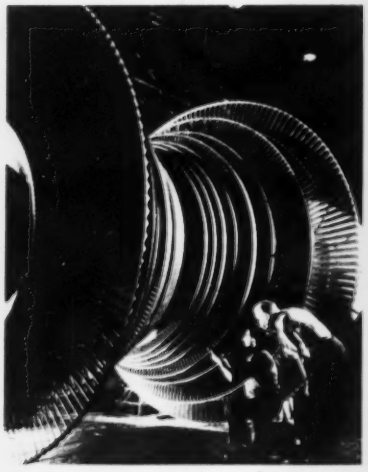


Heart of the Reheater

This low-pressure spindle for one of two 120,000-kw cross-compound reheat steam turbines will be installed in Wisconsin Electric Power Co.'s Oak Creek, Wis., station. Allis Chalmers Mfg. Co. reports the longest blade of the 178,000-pound spindle is 40 inches; maximum tip diameter, 13 feet 4 inches. Top speed of the longest blade will be 1260 feet per second

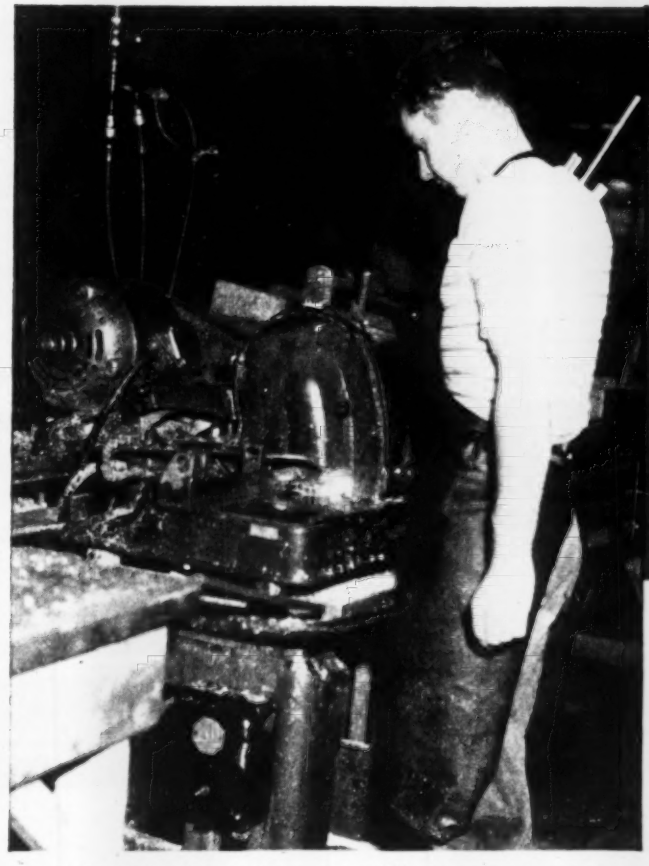
Foundry Package Available

Four-in-one foundry package of synthetic materials required for the shell molding process and for traditional sand casting is available from General Electric Co.'s Chemical Division.

Included are two materials essential to shell molding S-1054 phenolic resin binder and SM-55 silicone parting agent to release shell molds from their metal patterns. These, with GE's liquid core binder resin and Permafil for impregnating porous castings, enable foundries to obtain all necessary synthetics from a single supplier and receive application assistance.

Film Shows Welding Practice

Series of film strips for use by instructors to introduce students to the welding process, its equipment and where it is used is available from Lincoln Electric Co., Cleveland. The series presents in color preliminary steps in making basic joints with emphasis on safe practice. Closeups of the arc in action show each step in holding and moving the electrode, preparing and making joints, in several positions.

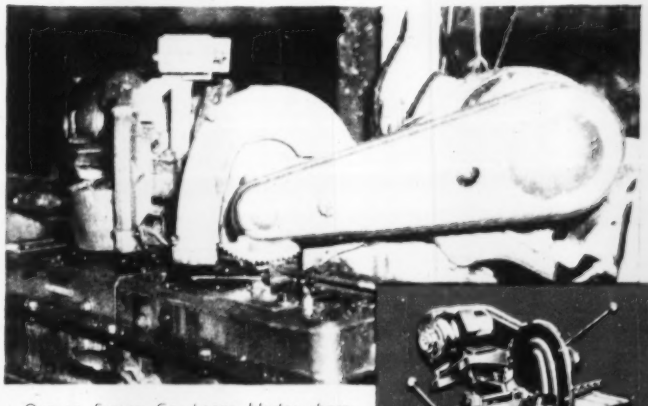


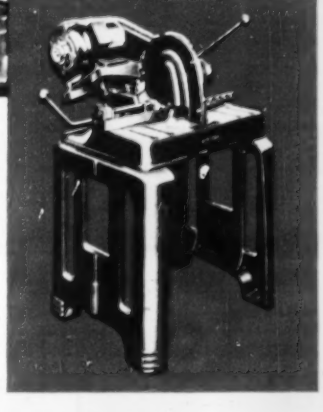
DELTA Cut-Off Saws

mitre-cut aluminum frames for 2.9¢* each

*Includes all charges for depreciation, interest on investment in tools, maintenance, power and labor

At Orange Screen Co., with an output of 900 pieces per hour, cost of making mitre cuts on aluminum frames on double Delta cut-off saws is only 2.9 cents each, including all charges for depreciation, interest on investment in tools, maintenance, power and labor.





Orange Screen Co. keeps blades sharp, uses 10" steel blades that average 36,000 cuts between sharpenings. Maintenance in nine years has been negligible, they report.

DELTA MILWAUKEE

DELTA QUALITY MAKES THE DIFFERENCE

HERE'S HOW ORANGE SCREEN CO. SAVES

Delta abrasive cut-off saws set in pairs and specially tooled make the mitre cuts on both ends of aluminum window frame members at the same time at a cost of 2.9 cents per piece at the Orange Screen Co., Dover, N. J.

Says E. J. Belliveau, chief manufacturing engineer: *"These set-ups have worked like a charm for nine years. We need their high speed 4000 rpm spindle speed and 10,500 fpm surface speed. An operator — man or woman — can feed an 18' extrusion 1½" x 3½" up to 3" x 1" and turn out 900 pieces per hour. In spite of this fast pace, women operators regularly get incentive production 30 to 80 per cent above base.*

"As a matter of fact, we've standardized on Delta tools all over the plant. Our Delta tools — 20 cut-off machines, 27 drill presses, 3 belt sanders, 5 band saws and 2 circular saws — all have a fine record for accuracy, and with their small initial cost and long life, depreciation is extremely low."

There it is — history repeating itself. Another alert management that's found that low-cost, adaptable, accurate Delta tools out-produce and out-profit far more costly tools. It's easy to find out how you, too, can get these production savings. Talk to your Delta dealer listed in the yellow pages of your phone book under "Tools" or "Machinery." And send for the most useful tool catalog you can have in your desk — Delta All-Catalog. Delta Power Tool Division, Rockwell Manufacturing Co., 6386 North Lexington Ave., Pittsburgh 8, Pa.

DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

stainless

Parts and Fasteners

CAMCAR
COLD-FLOW

Camcar specialists have developed Cold-Flow techniques for working Stainless and other non-corrosive materials to give you the same prompt service supplied on standard materials. You can choose material specifications from Camcar's inventory of Stainless Steels to solve both design and delivery problems.

STANDARD Stainless Fasteners supplied from stock for prompt shipment. Monthly stock list mailed on request.

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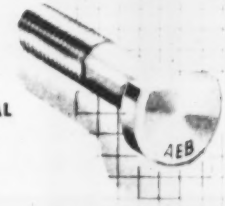

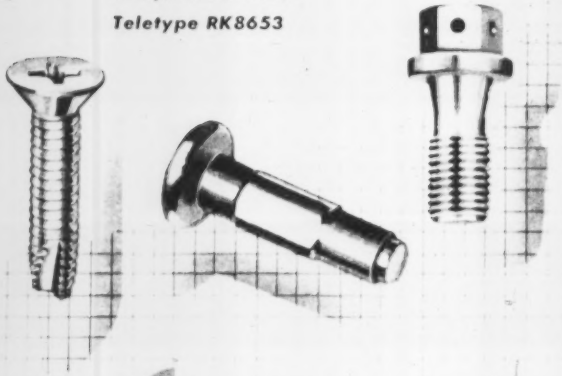

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CALENDAR
OF MEETINGS

March 8-11, American Institute of Chemical Engineers: Annual spring meeting. Hotel Buena Vista, Biloxi, Miss. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

March 11, Foundry Education Foundation: Annual meeting and technical, university & industry advisory committee conference. Hotel Cleveland, Cleveland. Foundation address: Terminal Tower, Cleveland 13. Executive director: George K. Dreher.

March 11-12, Society of the Plastics Industry Inc.: Annual Canadian conference. General Brock hotel, Niagara Falls, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 15-19, American Chemical Society: Spring meeting. Hotels Statler and Biltmore, Los Angeles. Society address: 1155—16th St. NW., Washington 6. Assistant secretary: R. M. Warren.

March 16-18, National Association of Waste Material Dealers: Annual meeting. Hotel Conrad Hilton, Chicago. Association address: 271 Madison Ave., New York 16.

March 16-20, National Association of Corrosion Engineers: Annual conference. Hotel Sherman, Chicago. Association address: 918 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

March 16-20, National Association of Manufacturers: Institute on Industrial Relations. Hollywood Beach hotel, Hollywood-by-the-Sea, Fla. Association address: 14 W. 49th St., New York 20. Director, employee relations division: Sybil S. Patterson.

March 17-18, Steel Founders' Society of America: Annual meeting. Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

March 18-20, American Society of Tool Engineers: Annual meeting. Hotel Statler, Detroit. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

March 19, National Industrial Conference Board: General session. Netherland-Plaza hotel, Cincinnati. Board address: 247 Park Ave., New York. Secretary: Clyde L. Rogers.

March 19-20, Porcelain Enamel Institute: West Coast conference. Hotel Statler, Los Angeles. Institute address: DuPont Circle Bldg., Washington. Secretary: John C. Oliver.

March 19-20, American Hot Dip Galvanizers Association Inc.: Annual meeting. Netherland Plaza hotel, Cincinnati. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart Swensson.

March 23-25, Liquefied Petroleum Gas Association: Annual Southeastern district convention & trade exhibit. Hotel Biltmore, Atlanta. Association address: 11 S. LaSalle St., Chicago 3. Publicity: Robert E. Borden.

March 23-27, American Society for Metals: Western metals congress & exposition. Pan-Pacific Auditorium, Los Angeles. Information: 7619 Beverly Blvd., Los Angeles. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

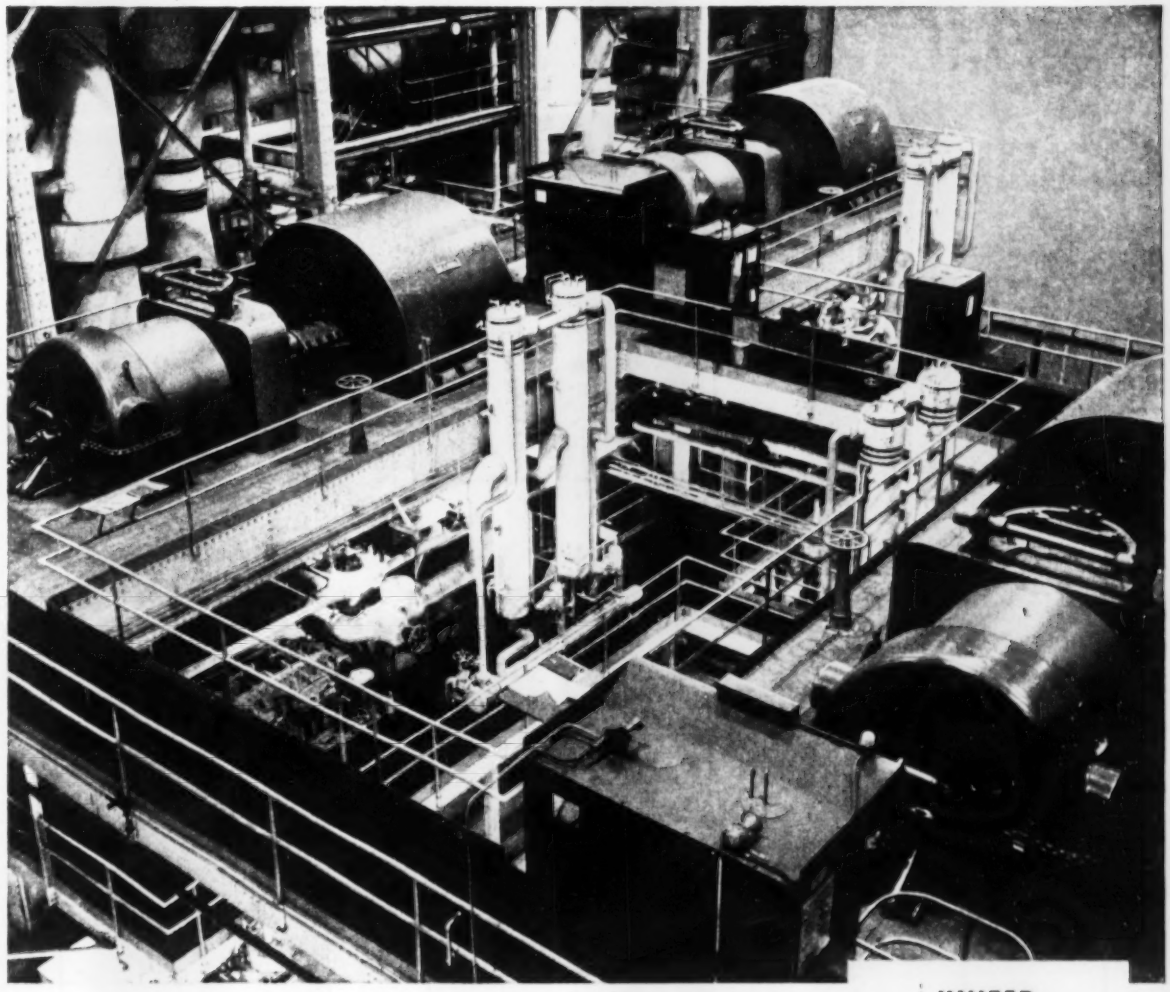
March 23-27, National Association of Power Engineers Inc.: Annual spring meeting and exhibit. Hotel Sherman, Chicago. Association address: 176 W. Adams St., Chicago 3. Secretary: A. F. Thompson.

March 23-27, Pressed Metal Institute: Annual meeting. Hotel Carter, Cleveland. Institute address: 2566 E. 130th St., Cleveland 20. Managing director: Orrin B. Wernitz.

March 23-27, Society of Automotive Engineers: National production meeting. Hotel Statler, Cleveland. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 26-27, Instrument Society of America and Carnegie Institute of Technology: Iron & steel instrumentation conference. Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Rod Rinbach.

Continued on p. 139



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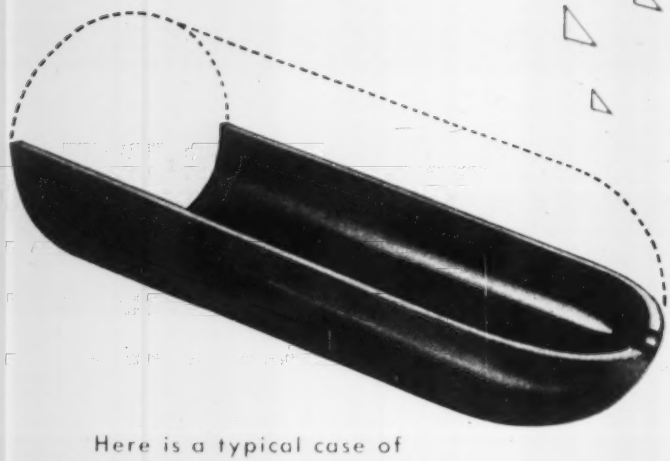

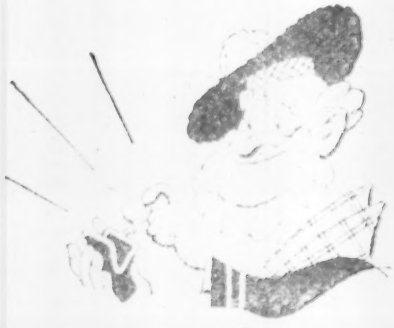

Here is a typical case of economy. Shown is a section of a cylindrical part now made in one piece from Wolverine tube with both ends almost closed by means of the Wolverine Spun End Process.

Having no seams or joints, this redesigned part offers assurance against leaks; and makes the complete unit more dependable at all times.

This product was formerly made from a cylindrical form capped at both ends and silver soldered at the joints.

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Tubular parts requiring tapered, rounded, flat or other shaped ends can be made easily, quickly and economically by the Wolverine Spun End Process*.

By virtue of their improved design, the finished parts made by this process perform more efficiently, and their modern lines add to the sales appeal.

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A request on your letterhead will bring you a copy of our brochure "Spun End Process."

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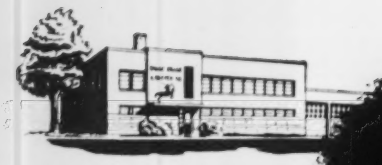

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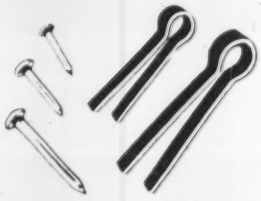

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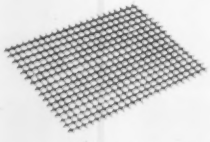

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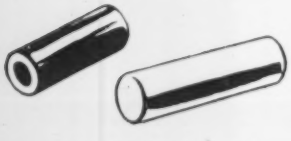

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Boston	Dallas	Indianapolis	Minneapolis	Philadelphia	St. Louis	(sales office only)

(Continued from p. 134)

March 31-April 2, The Magnesium Association: International magnesium exposition. National Guard Armory, Washington. Association address: 122 E. 42nd St., New York 17. Secretary: Martha I. Hanson.

April 7-9, Steel Shipping Container Institute: Annual meeting. Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 8-10, Society of the Plastics Industry Inc.: Pacific Coast conference. Last Frontier hotel, Las Vegas, Nevada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

April 9-10, Malleable Founders' Society: Market development conference. Cornell University, Ithaca, N. Y. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

April 9-11, Lead Industries Association: Annual meeting for members. The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 12-15, American Supply & Machinery Manufacturers Association: Annual meeting and conference booth program. Hotel Columbus, Miami, Fla. Association address: 814 Clark Bldg., Pittsburgh 22. Secretary: R. Kennedy Hanson.

April 12-16, Electrochemical Society Inc.: Annual spring meeting. Hotel Statler, New York. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

April 13-15, International Acetylene Association: Annual spring meeting. Hotel Biltmore, Atlanta. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13-15, American Society of Lubrication Engineers: Annual meeting and exhibit. Hotel Statler, Boston. Society address: 343 S. Dearborn St., Chicago 4. Secretary: William P. Youngclaus Jr.

April 13-16, National Industrial Conference Board: Annual meeting for members. Miami, Fla. Board address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehart.

April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting. Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Ferney Jr.

April 16-19, Grinding Wheel Institute: Spring meeting. The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, re F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting. Hotel Sherman, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

April 19-23, American Hardware Manufacturers Association: Spring meeting. Hotel Adolphus, Dallas. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

April 20-22, AIME Blast Furnace, Coke Oven & Raw Materials Committee and National Open Hearth Steel Committee: Annual conference. Hotel Statler, Buffalo. Institute address: 29 W. 39th St., New York 18.

April 20-22, Metal Powder Association: Annual meeting and exhibit. Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 20-23, National Screw Machine Products Association: Spring meeting. Hotel St. Moritz, New York. Association address: 2860 E. 130th St., Cleveland 20. Secretary: Orrin B. Wernitz.

April 21-23, Caster & Floor Truck Manufacturers Association: Spring meeting. Edgewater Beach hotel, Chicago. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

April 27-28, Galvanizers Committee, American Zinc Institute: Annual meeting. Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary-Treasurer: E. V. Gohl.

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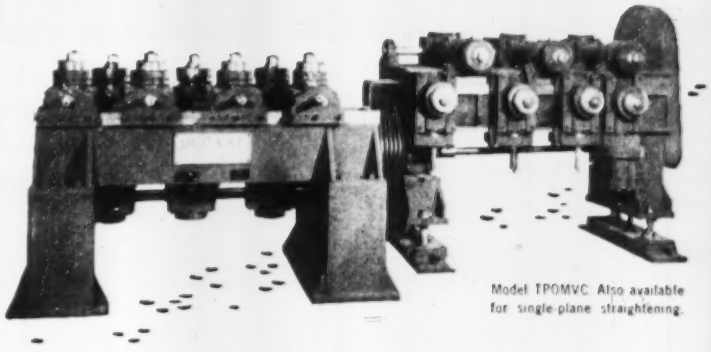

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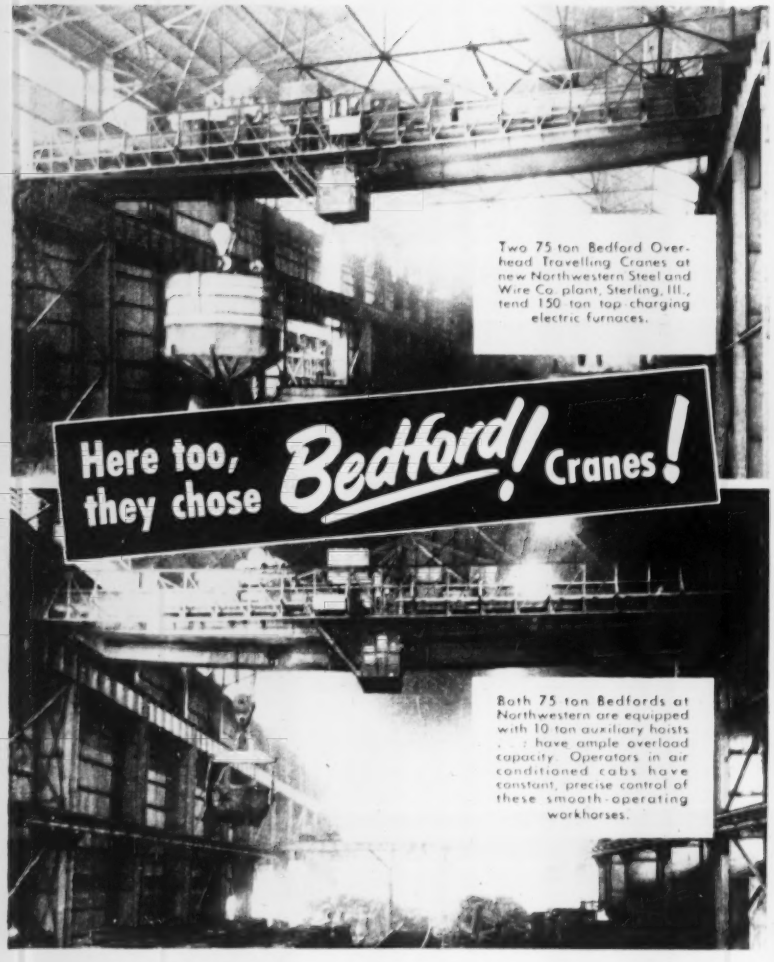
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MEN OF INDUSTRY

(Continued from Page 90)

member of the New York sales staff of **Girdler Corp.'s** Votator Division. He joined Girdler in 1944 and in 1950 was assigned to the field service and engineering staff with headquarters in New York.

Timken Roller Bearing Co. appointed **Richard K. McConkey** assistant general manager of its industrial division, Canton, O. He has been district manager for the division at

RICHARD K. McCONKEY
. . . *Timken appointment*

the Moline, Ill., office. He succeeds the late **Melvin H. Kuhl.**

Robert J. Heggie was elected a director of **A. M. Castle & Co.**, Chicago.

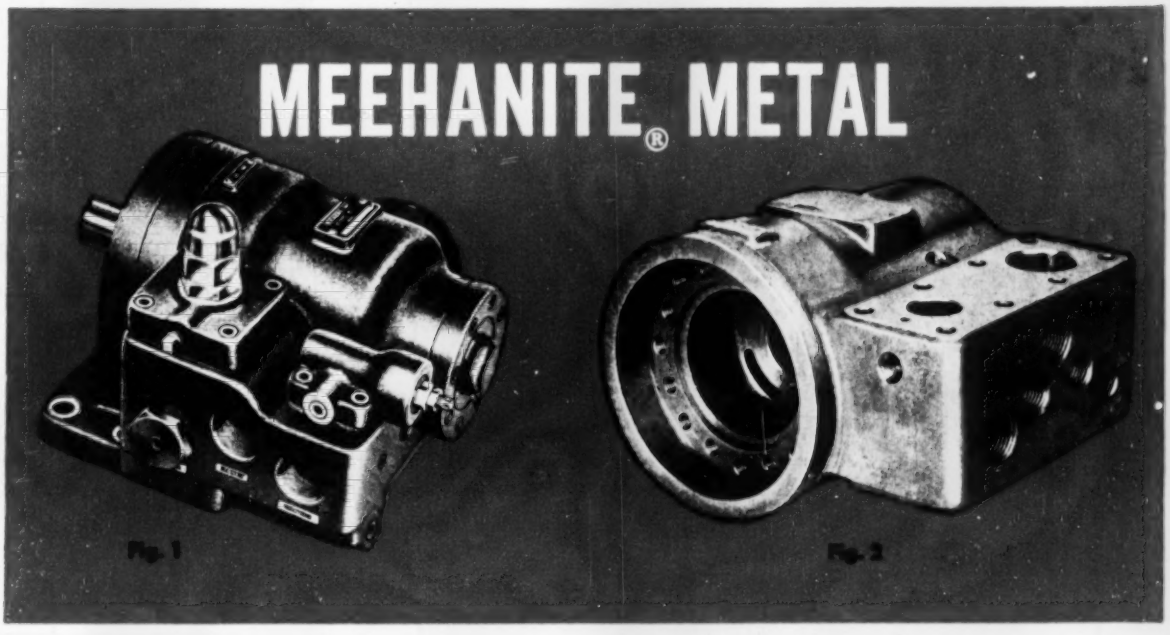
Philip A. Gaebe, associated with the production department of Kaiser Steel Corp. at its Fontana, Calif., plant, has been appointed senior sales engineer for basic refractories and chemicals in the Pittsburgh area for the chemical division of **Kaiser Aluminum & Chemical Sales Inc.**

Tom Dwyer of Minneapolis was named district sales manager by **Duchess Co.**, Fairfield, Iowa.

James E. Drylie was appointed assistant sales manager in charge of the Sup-R-Guy Products Division, **Guibert Steel Co.**, Pittsburgh.

Pembroke W. Taylor was named

A FAMOUS Name in Pumps Specifies a FAMOUS Name in Materials...



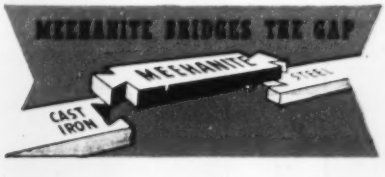
NO one familiar with industrial products will deny that Vickers, Inc., Detroit, Mich. is truly a famous name in pumps and all types of hydraulic equipment.

Among the many important types of pumps produced by Vickers is the combination Vane-Type Pump (Fig. 1). In this high pressure unit designed for compactness for successful operation in limited space it is obvious that the housing or body (Fig. 2) would have to be produced in a metal which would provide regularly and dependably pressure tightness, high tensile strength, uniformity, freedom from defects and good machinability. It is for these reasons that Vickers regularly specify Meehanite castings.

The name Meehanite Metal has also earned itself fame among design engineers, production executives, management and purchasing officers who concern themselves with the selection, specification and procurement of component parts and materials requiring the maximum, both property and quality-wise.

Whether your castings require density and pressure tightness; or high tensile strength; or heat treatability for toughness and wear resistance; investigate the wide range of materials available in Meehanite castings.

Remember that Meehanite "Bridges the Gap" between cast iron and steel!



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E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry	Providence, Rhode Island
Compton Foundry	Compton, Calif.
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
De Laval Steam Turbine Co.	Trenton, New Jersey
M. H. Detrick Co.	Peoria, Ill. and Newark, N. J.
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Kaehring Co.	Milwaukee, Wisconsin
Lincoln Foundry Corp.	Los Angeles, California
London Concrete Company, Ltd.	Brantford, Ontario
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
The Henry Perkins Co.	Bridgewater, Massachusetts
Palmyra Foundry Co., Inc.	Palmyra, New Jersey
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
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The Stearns-Roger Manufacturing Co.	Denver, Colorado
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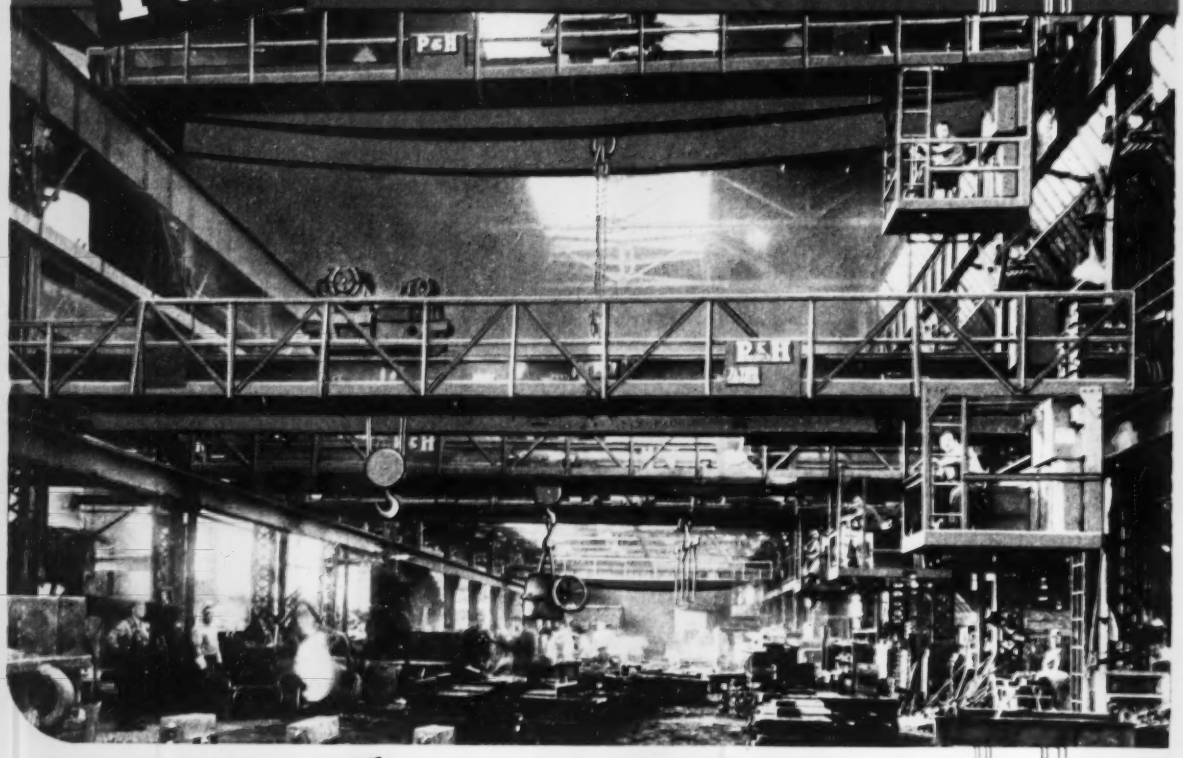

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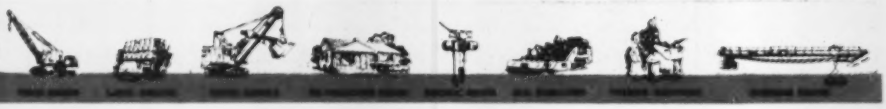
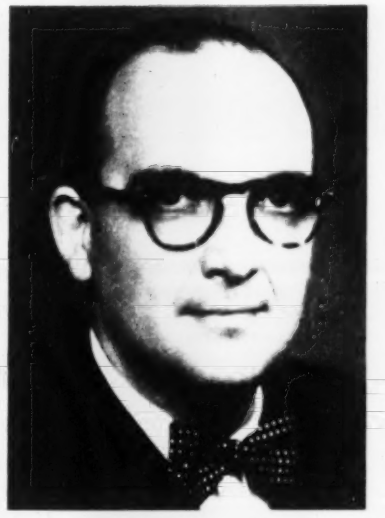




GORDON M. SOMMERS
. . . chief eng. at Clearing Machine

manager, distributor sales, **Riverside Metal Co.**, Riverside, N. J. Prior to serving the National Production Authority, he was with Revere Copper & Brass Inc.

Gordon M. Sommers was appointed chief engineer at the Hamilton, O., plant of **Clearing Machine Corp.**

Cro-Plate Co. Inc., Hartford, Conn., elected **Eugene B. Hotchkiss** chairman of the board.

A. M. Sargent, founder and former president of **Pioneer Engineering & Mfg. Co.**, resigned his interest in that firm to open his own consulting engineering office at 10120 W. McNichols Rd., Detroit.

Del Roskam, manufacturing manager, was promoted to vice president-manufacturing, **Cessna Aircraft Co.**, Wichita, Kans.

Herman A. Schaefer was elected secretary of **Hewitt-Robins Inc.** to succeed **George F. Goodyear** who retired last year when the company's executive offices were consolidated in Stamford, Conn.

Charles C. Conley was appointed to the newly created position of supervisor of research of **Houdaille-Hershey Corp.**, Detroit.

Dorothy M. Bryant and **Jerome Linder** have become associated with **Hooker Electrochemical Co.**, Niagara Falls, N. Y., as chemists in the development and research department. **Neil F. Tomlin** joins the company as a draftsman and **Ormond W. Gay** as a mechanical engineer in the engineering department.

Taco Heaters Inc., Providence, R. I., appointed **Robert H. Chaffee** sales manager, heating and cooling products. He will have headquarters at the Providence offices.

Utica Drop Forge & Tool Corp. appointed **Paul L. Thornburg** factory representative in Virginia, North Carolina, South Carolina and Tennessee.

Walter E. Bornemann, manufacturers' representative at New Orleans, was appointed Mississippi-Louisiana representative for **H. H. Buggie & Co.**, Toledo, O.

A. G. Moore is representative for the New Jersey marketing area in sales, field application and servicing of products for **John Hewson Co.**

Appointed credit manager in the treasury department of **U. S. Steel Corp.** in Chicago is **Joseph J. McGovern.** Assistant credit managers are **Donald C. Sheldon, James W. Schalles** and **Carl J. Harley.**

Dr. Sylvan Wallach was appointed senior scientist on reactor design development for **Walter Kidde Nuclear Laboratories**, Garden City, L. I., N. Y.

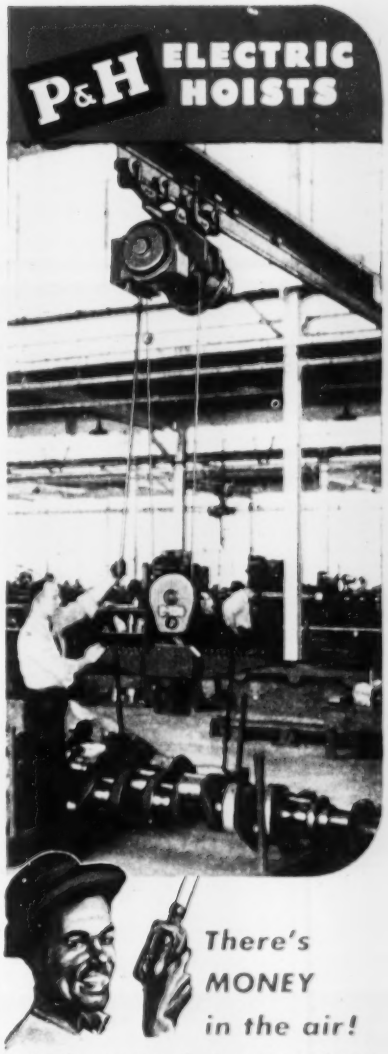
J. C. Thorburn was appointed branch manager of **Westinghouse Electric Corp.'s** manufacturing and repair plant at Buffalo.

Carl H. Drenske will represent **Republic Mfg. Co.**, Cleveland, covering California, Washington and Oregon. His headquarters are in Van Nuys, Calif.

Miller Electric Mfg. Co., Appleton, Wis., named **Alexander McKenzie** district sales manager for parts of Ohio, Pennsylvania and West Virginia.

John P. Andrews joined the Lukenweld Division, **Lukens Steel Co.**, Coatesville, Pa., as a sales engineer. **Henry F. Peters** becomes manager of the technical service department of the company.

Maynard C. Miller was appointed sales engineer at the Detroit office of **Commercial Contracting Corp.**



There's MONEY in the air!

In the average plant, materials handling accounts for 20¢ of the total cost of the product. How about your operation? Are skilled workers wasting your time and money being load lifters? There's a better way

Handle it "thru-the-air" FASTER—FOR LESS!

P&H can help you cut costs, with swift, safe movement of loads above floor congestion. There's a P&H Electric Hoist to suit your needs exactly, the Zip-Lift for loads up to 1 ton the Hevi-Lift for loads up to 15 tons available with hook, jib or trolley mounting. A P&H representative can show you where and how to save money.

Call your P&H Dealer

P&H ELECTRIC HOIST DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

Galvanic Corrosion Study

Bureau of Standards research shows how little zinc it takes to cut steel corrosion

STUDY of underground corrosion of hot-dipped galvanized steel pipe was recently completed by National Bureau of Standards. Results confirm previous NBS work in showing that galvanized steel having 3 ounces of zinc per square foot of exposed surface is highly resistant to corrosion in many soils which are very corrosive to bare steel.

Short lengths of galvanized and uncoated steel pipe, and plates of zinc, were buried at 15 test sites for periods up to 13 years. Located in widely separated parts of the United States, the test sites represented a wide range of soil properties.

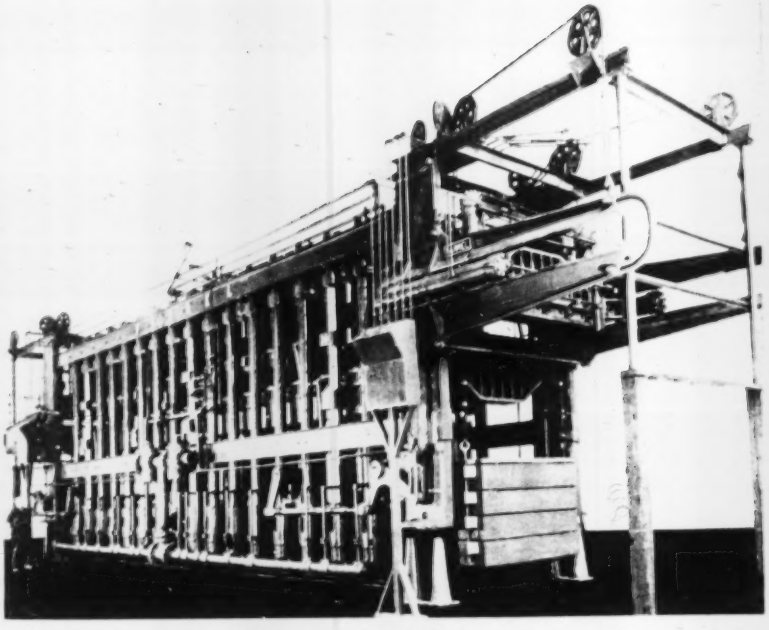
After each of five periods of exposure, a set of specimens of each material was removed and returned to the NBS laboratories. After removal of the corrosion products, determinations were made of loss in weight, depth of the deepest pits, and percentage of area of galvanized specimens on which coating remained.

Thickness Varied—Although the nominal weight of the zinc on all the coated specimens was 3 ounces per square foot, actual thickness varied over a wide range. This was shown by a large number of thickness measurements made by a magnetic method, using unexposed samples of pipe from the same lot as the buried specimens. Additional determinations by an electrolytic stripping method showed that a large part of the zinc that was applied to the steel pipe was converted into alloys of zinc and iron.

Zinc coatings provided good protection in most of the soils. In one soil in which bare steel pipe was perforated by corrosion after exposure for only a few years, the coating on the galvanized specimens remained perfectly continuous throughout the entire 13-year period. In only two of the 15 soils, both organic, was the zinc coating of negligible protective value.

Surprising Results—An interesting finding of the NBS study was the high corrosion resistance that the galvanized specimens continued to show in most of the soils after the outer zinc coatings, and even after the zinc-iron alloy layer, had entirely corroded away. This continuing protection is tentatively attributed to an inorganic coating, probably silicious, believed to have been deposited by galvanic action between the outer zinc coating and the underlying steel or alloy layer.

This tentative explanation is based in part on unpublished studies which indicate that the zinc-iron alloy layer does not protect steel sacrificially (cathodically), and that the alloy is no more resistant than steel to soil corrosion.



Conveyor Belt: 72-Inch Width Possible

Goodyear Tire & Rubber Co. has completed the first flat belt to be vulcanized on its new giant conveyor press belt. Designed and built by Farrel-Birmingham Co., the press is more than 80 inches wide and can vulcanize conveyor belts up to 72 inches wide. It allows 1500 pounds of working pressure on each of 32 rams. This in turn produces a pressure of 275 pounds psi on the press plates

Handling Clinics Travel

Traveling material handling clinics to discuss local handling problems with chapter members of the American Material Handling Society will be conducted in principal cities during 1953. Decision to conduct the sessions was made by directors of the Material Handling Institute Inc. at its recent meeting in New York.

Purpose of the clinics, according to the institute, will be to promote better understanding of correct handling equipment application. Each of several traveling groups will be headed by an MHI officer, with specialists in various handling problems selected from the membership.

Ethyl Chloride Handling Rules

Safety rules and regulations for handling, storing, shipping and disposing of ethyl chloride are outlined in safety sheet SD-50 published by Manufacturing Chemists Association Inc.

While ethyl chloride vapors are highly inflammable and tend to form explosive mixtures with air, the booklet points out that the material can be handled with safety if employees are educated properly and are familiar with its hazards. Also listed are Interstate Commerce Commission regulations regarding loading and unloading, plus first aid procedure to follow in case of exposure to excessive vapors or contact with skin.

Copies of the 16-page data sheet can be obtained for 25 cents from the association, 246 Woodward Bldg., Washington 5.

$80,000 Saved By Field Engineering

Elwell-Parker put flanged wheels on this crane for railroad car repair shop. This saved great expense of paving yard for rubber tire crane. This Elwell-Parker crane also cut man-hours 90% on replacing car wheels.

ELWELL-PARKER

truck installations are *Field Engineered* to your needs

Buyers of Elwell-Parkers get far more than just a quality truck. One of many plus values is a personal analysis of their material handling needs by an E-P Field Engineer. There are 40 of these E-P men, resident in all principal cities. The average experience of these truck specialists exceeds fifteen years . . . behind them is Elwell-Parker's unmatched, 47 years of truck know-how.

E-P Field Engineers can help you select exactly the right truck from the complete line of Elwell-Parker high and low lift platform trucks, fork trucks, or mobile cranes. To solve your individual handling problem, they will work closely with you to design a special or modified truck.

E-P Field Engineered installations insure the best possible truck performance at no extra cost.

Learn about all the other Plus Features of Elwell-Parkers by writing for this General Catalog. The Elwell-Parker Electric Co., 4102 St. Clair Ave., Cleveland 3, Ohio.

ELWELL-PARKER

POWER INDUSTRIAL TRUCKS

Established 1893

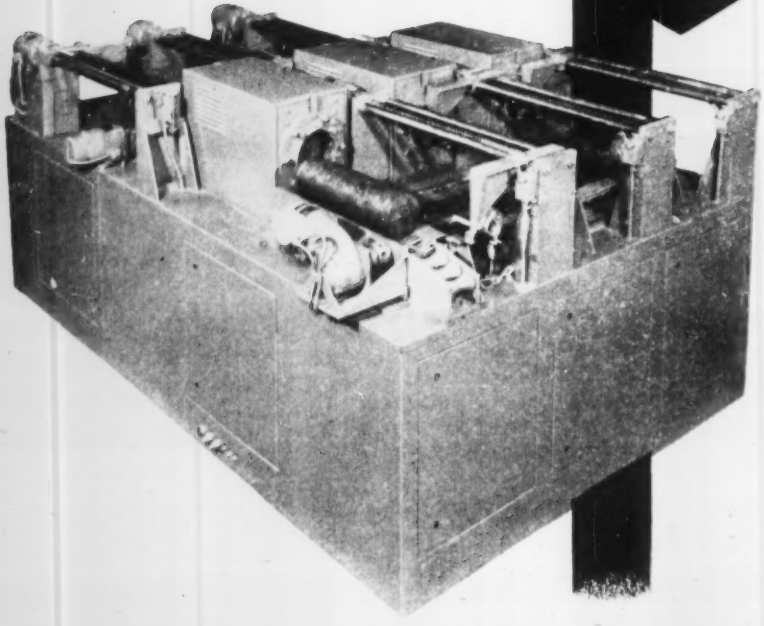
the first completely universal....

60-cycle **induction**

BILLET HEATER

THIS Loftus Universal Thermo-Induction furnace is the most flexible 60-cycle billet heater ever designed. You can heat every non-ferrous metal, in the same furnace, either consecutively or simultaneously, to its respective forging or extrusion temperature. The unit maintains high efficiency, constantly, even when heating **short-length** billets.

Loftus Thermo-Induction gives you the most practical, dependable, and efficient method of heating non-ferrous metals. You achieve uniform heating in a matter of seconds. Production is continuous, and completely automatic. The press operator controls the furnace. Separate, positive control of each coil is at his fingertips.



The Loftus 60-cycle Thermo-Induction Heater illustrated is designed to heat copper, brass, aluminum, and cupro-nickel for extrusion purposes. The unit is readily adaptable for forging and rolling processes. It is possible, with this billet heater to heat a 5" dia. Aluminum billet to 800° F., an 8" dia. brass billet to 1550° F., and a 10" dia. cupro-nickel billet to 1950° ALL AT THE SAME TIME, IN THE ONE FURNACE. Each billet is heated independently . . . from a single control panel.

Send Today for Booklet describing Loftus 60 Cycle Induction Heating in Detail

Loftus ENGINEERING CORPORATION

Designers and Builders of Industrial Furnaces

610 Smithfield Street • Pittsburgh 22, Pennsylvania

NEW PRODUCTS and equipment

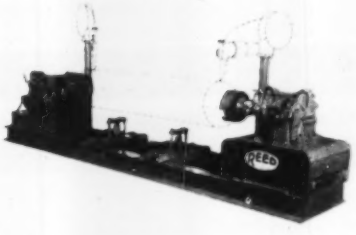
Reply cards on page 171 will bring you more information on any new products and equipment in this issue

Combined Press, Seam Welder

. . . assembles, welds vessels

Combination assembly press and girth seam welding fixture is designed for assembly and automatic welding of light vessels, such as tanks for water heaters. The fixture, designated AW-205, handles tanks to 24 inches diameter, 7 feet long and weighing up to 4000 pounds.

It features a 5-ton assembly pressure for pressing tank heads on the



ends of the shell and two air-operated kick-out devices for rapid spotting and removal of vessels. Headstock has a 10 to 1 variable speed range. Reed Engineering Co., Dept. ST, 1003-17 W. Fairview Ave., Carthage, Mo.

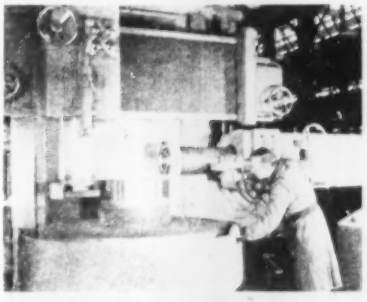
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Vertical Chucking Grinder

. . . six sizes: 30 to 74 inches

Vertical chucking grinder is offered in six sizes, 30 through 74 inches, to meet large work size requirements. Variable speed drive provides infinitely variable table speeds, from creep to top speed as specified. Grinding spindle speeds can be furnished to meet requirements, with maximum horsepower rating for main head grinding spindles of 10 hp and for side head spindles, 5 hp.

Dual control desks with pushbutton controls provide maximum operating ease and efficiency. Desks are interlocked, located on either side of the machine so the oper-



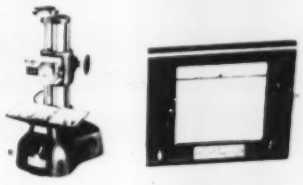
ator can work from the most advantageous side. To provide automatic lubrication, Trabon systems installed on main and side heads distribute oil, properly metered, to all bearings requiring lubrication. Bullard Co., Dept. ST, Bridgeport 2, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Gage Block Comparator Stand

. . . magnification: 110,000 to 1

Universal Electrolimit circuit and gage block comparator stand are combined with the manufacturer's



electronic recorder to provide an instrument with 110,000 to 1 magnification. Recorder's 11-inch scale is equal to only 0.0001-inch, with each primary division equal to five millionth inch and secondary divisions equal to one millionth inch.

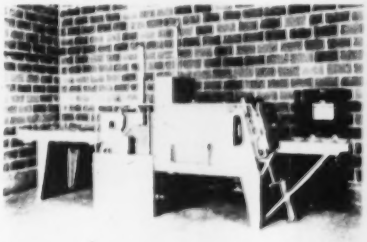
The electronic recorder is provided with a pen lifter and chart drive switch. Thus, under normal operation it is used as an indicating instrument. By using the switch, the chart carriage is started and measurements are recorded on the chart paper. Pratt & Whitney, division of Niles-Bement-Pond Co., Dept. ST, W. Hartford 1, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Metal Treating Furnace

. . . combines draw, quench

Combination draw-quench metal treating furnace is applicable for bright, scale-free tempering and controlled oxidation tempering from 400 to 1400 F. Furnace is fully automatic, with heating chamber separated from the combination



cooling chamber and quench tank by a sealed inside door. Controlled endothermic atmosphere is provided in both heating and cooling chambers.

Parts being treated do not contact air at any time during tempering. Work previously bright hardened remains clean and scale-free, eliminating blasting or pickling. The controlled atmosphere also makes it possible to hold oxidation or blue tempering within strictly controllable limits. Quench

An Open Letter of Thanks to V.I.P.*

H. D. PAXSON, PRESIDENT
THEDA L. PAXSON SEC.-TREAS.

PHONE 3486
P. O. BOX 214

PAXSON MACHINE COMPANY

Engineers and Builders of
COLD-ROLLED STRIP-MILL EQUIPMENT
Specializing in Slitting Lines
SALEM, OHIO

Users of Paxson Equipment
Coast to Coast
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Dear Customers:

Thanks to you *VERY IMPORTANT PEOPLE for giving us the users' point of view in developing Paxson Slitting Equipment.

You, the actual users, are the ones who really engineered and designed Paxson Slitting Lines.

The combined knowledge, ideas and suggestions of slitting men in plants large and small have guided us in developing custom built lines that best meet your specific needs.

For the utmost in modern efficiency and economical operations, users rely on us for both general and heavy duty lines.

Now, more than ever, it truly can be said:
"PAXSON GIVES YOU THE EDGE".

Appreciatively yours,

PAXSON MACHINE COMPANY

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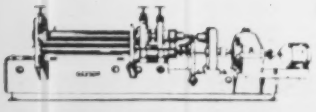
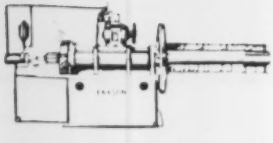
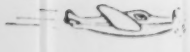


SLITTERS

COILERS



PAY-OFF REELS



Do You Fly?

2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

6

PAXSON MACHINE CO.

SALEM • OHIO

Engineers and Builders of Cold-Rolled Strip-Mill Equipment SPECIALIZING IN SLITTING LINES

REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

rack and loading, intermediate and unloading doors are air hydraulically operated. Ipsen Industries Inc., Dept. ST, 715 S. Main St., Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO 4

Furnace Line Addition

. . . for enamel, heat treat work

Model TF-24 electric furnace is adaptable for porcelain enameling as well as a wide variety of heat treating operations. Unit's 36 x 48 x 24-inch chamber size makes it practical for handling large, heavy items or production quantities of

smaller products. It operates at 2400 F with a work load of 350 pounds per hour.

Heating elements are set on each side of the chambers, from front to back. Sufficient power is provided to produce rapid recovery time after door is opened or closed during load change. Other design features include counterbalanced door and operation by foot-controlled air cylinder. Pereny Equipment Co., Dept. ST, 893 Chambers Rd., Columbus 12, O.

FOR MORE DATA—CIRCLE REPLY CARD NO 5

Sand Workability Resin

. . . eliminates clay balls

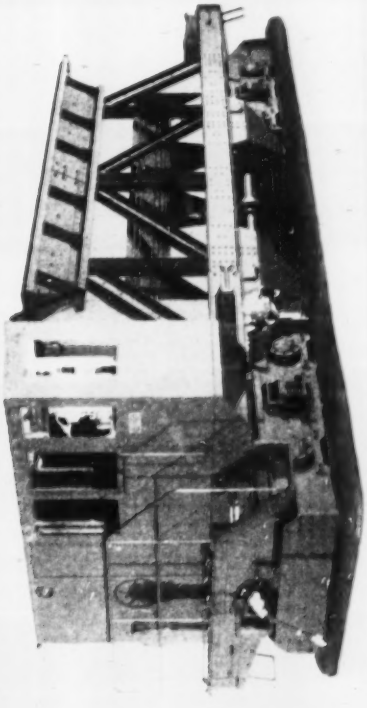
Lustrex 886 resin is designed to eliminate clay balls from foundry sand and make possible production of truer and more economical castings. Its application is said to permit uniform packing, eliminating most cracks, fissures and soft spots. Reductions in clean-up time result.

Manufacturer reports 1 pound of the resin produces uniform clay distribution in 1 ton of foundry sand. Only about one-sixteenth of the resin is burned out each time

FOR THE VERY BEST
See ATLAS
TRANSFERS - SCALE CARS
COAL CHARGERS - COKE QUENCHERS
60-TON BOTTOM DUMP ORE TRANSFER CAR

This is one of the latest Atlas Transfer Car designs arranged for modern hydraulic operation. It provides close control of the discharge and eliminates freezing of air lines in the winter. A hydraulically operated pusher arm is provided of the latest horizontal telescoping type. The brakes also are hydraulically operated and apply automatically if pressure is low or if power fails.

At this plant the car must cross over to the coke track to shift coke cars. There is no conductor rail on the coke track so the car is equipped with a motor-driven cable reel attachment, enabling it to perform this switching function. When operating on the cable reel the collector shoes are cut out and automatically raised off of the conductor rails. The cab is overhung to give the operator a line of vision down the side of the car.

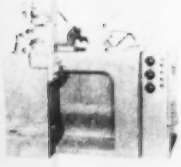


THE ATLAS CAR & MFG. CO.
ENGINEERS and MANUFACTURERS
1100 IVANHOE ROAD CLEVELAND 10, OHIO

bryant
internal grinding

no. 1309-W

Finishes 2 bores and a taper straight and concentric. 2 wheelheads are used on this semi-automatic. Max. traverse stroke, 6". Max. grinding length, 3½".

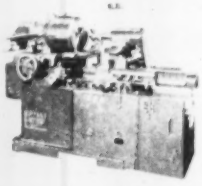


no. 1109

For high production of small bores where accuracy of size and finish are required. Max. traverse stroke, 6". Max. grinding length, 3½".

no. 1316

Two wheelheads for high production of jobs requiring face and bore, or face and O.D. grinding. Max. traverse stroke, 20". Max. grinding length, 8".

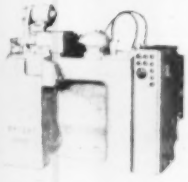


no. 1116

A general purpose hole grinder for tool room, small shop, or general production. Maximum traverse stroke, 20". Maximum grinding length, 8".

no. 1416

Specially designed for grinding bores in long work, such as machine tool spindles. Maximum traverse stroke, 20". Maximum grinding length, 8".



no. 1209

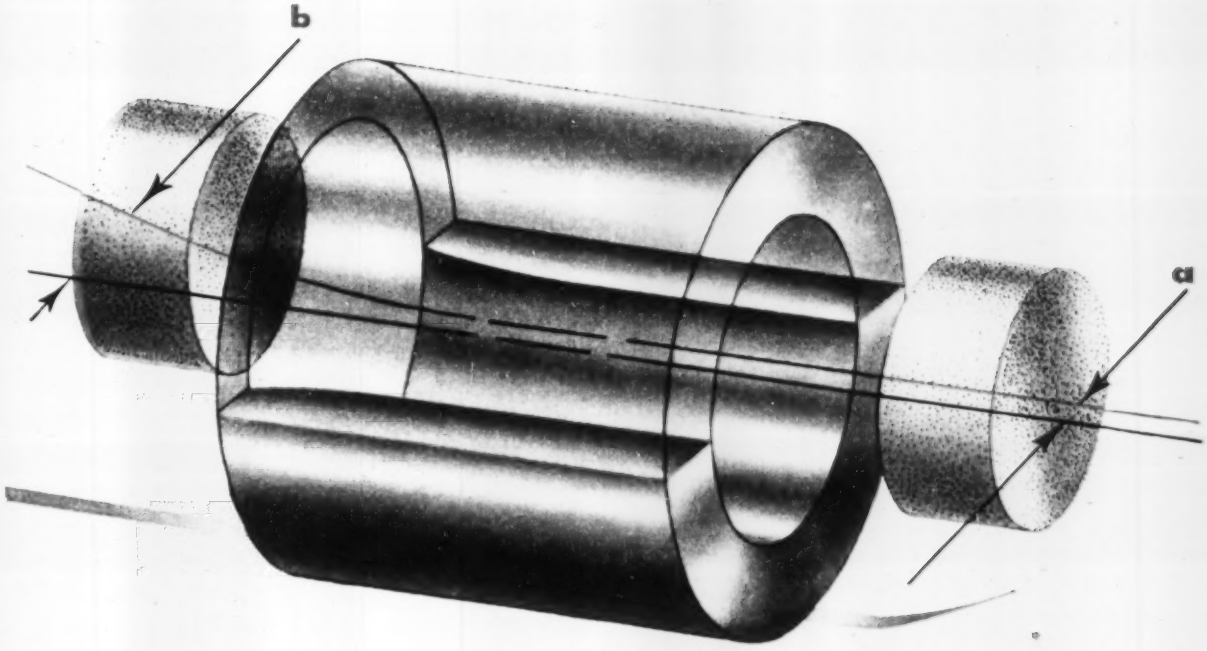
A fully automatic, high production machine for small and medium bore grinding. Max. traverse stroke, 6". Max. grinding length, 3".

no. 1460

For production or single piece hole grinding on parts up to 60" diameter. Max. traverse stroke, 21". Max. grinding length, 16".

no. 2209

For precision and high production grinding of ball bearing races, gears, rolls, bushings, etc. Max. traverse stroke, 6". Max. grinding length, ¾".



BELL mouth holes are a common internal grinding error. General available information advises simply turning the workhead or changing the length of traverse to correct this error, to generate a straight hole. In the case illustrated above, where bell mouth exists at one end of the hole, neither turning the workhead nor changing the length of stroke will correct this error.

In order to grind a straight hole the wheel must traverse the work in a straight line parallel to the axis of the work. The wheel path (the line in which the wheel traverses) is controlled by the slides under the wheelhead. If the slides are straight and true, the wheel path will be a straight line. If the path of the wheel varies from a straight line, the variation will be generated in the work.

At point "a" the wheel path and axis of the work are parallel and the wheel is set to grind a straight hole. Because of an error in the wheelslide ways, the wheel path is distorted and the wheel is plunged into the back end of the work and the wheel path and work axis diverge as shown at point "b". Wheelslide error can introduce distortion of many types within the work in addition to the one illustrated. The remedy is to correct the wheelslide ways which will, in turn, straighten the wheel path. The wheel contact will be improved, resulting in better finish.

Bryant Chucking Grinder Company
Springfield, Vermont, U. S. A.

Internal grinders • Internal & External thread gages

the sand is used. Plastics Division, Monsanto Chemical Co., Dept. ST, Springfield, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Helix Milling Cutter

. . . with 90° cutting surface

This high helix shear type milling cutter has a cutting surface of more than 90 degrees and is designed to mill compound contoured surfaces. The teeth are always in contact with the workpiece, clean themselves and impart a smooth finish. Douglas Tool Co., Dept. ST, 2300 E. Nine Mile Rd., Hazel Park, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Aluminum Oxide Compositions

. . . finishes aluminum castings

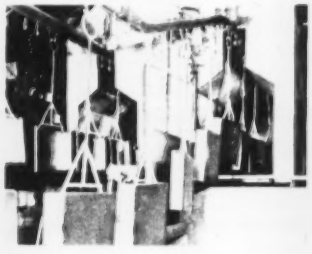
A series of aluminum oxide compositions for the coloring operation in the finishing of zinc base and aluminum die castings is available. It is claimed that compositions give castings of these metals the desired luster or color quickly. They may also be used in steel and stainless steel finishing. Hanson-Van Winkle-Munning Co., Dept. ST, Matawan, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Continuous Paint Stripping

. . . done by one-step chemical

Paint stripping from conveyor hooks, hangers and other line handling equipment, as well as paint rejects, is a regular production conveyor line operation with one-step chemical treatment. The



procedure provides for running the conveyor line hangers, etc., through a tank of one-step chemical stripper at a given point.

Prior to reaching this stage, finished workpieces are removed. At the stripping point, accumulated paint rejects can be placed on the line and stripped along with the equipment. Manufacturer reports the setup can mean a time savings of up to 90 per cent. The chemical can also be applied by spray method if desired. Klem Chemicals Inc., Dept. ST, 14401 Lanson Ave., Dearborn, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

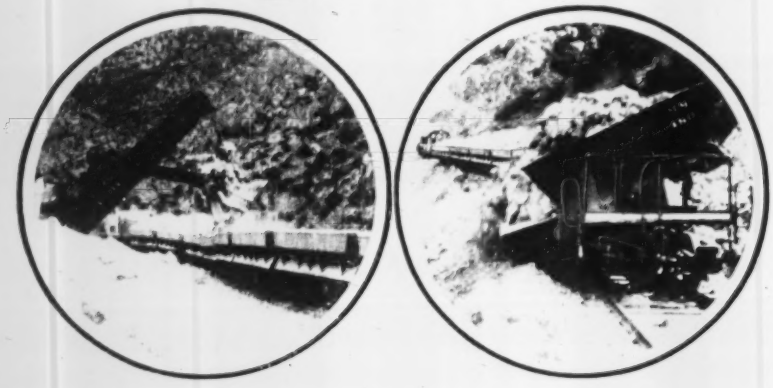
Automatic Small Part Elevator

. . . no personnel variables

Automatic elevator feeds small parts on a variety of production jobs. These include feeding elevated hoppers, transferring parts from conveyor to conveyor, elevating and metering parts to a continuous furnace or feeding automatic hoppers on machine tools. Continuous operation serves to eliminate personnel variables on production jobs.

Called the Magnavator, the elevator employs one or more Alnico permanent magnets mounted in a

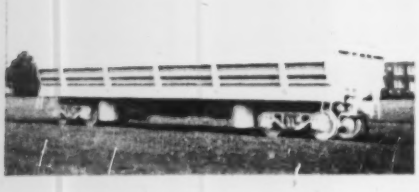
Yes, you're seeing DOUBLE



In fact, when you watch Differential Air Dump Cars in action you're seeing double in several respects —

DOUBLE ACTION — they dump cars both ways, to left or to right. The 50° dumping angle assures a clean dump, and the massive air cylinders (two on each side) assure speedy, reliable dumping power. The double trunnion, double fulcrum design are key features in Differential's amazing performance.

DOUBLE UTILITY — Good for hauling in ore and good for hauling out waste materials. Car is built to withstand abuse and heavy service. If you haul as many as 400 to 500 carloads yearly, the savings with Differential equipment will pay for the cars.



Differential Products Include: Air Dump Cars, Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Dumping Devices and Complete Haulage Systems

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

For Brass and Copper Tubing that will LAST...

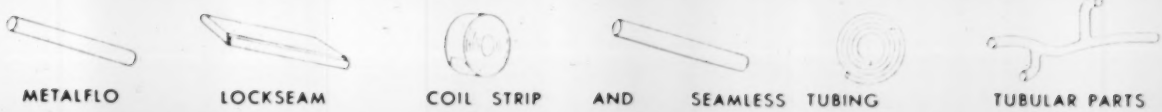
Alert tubing buyers everywhere have been quick to take advantage of the savings offered by H & H METALFLO. Originated and manufactured exclusively by H & H, this BRAZED BRASS tubing can be substituted for seamless tubing wherever economy is a factor . . . whether it be in the household accessory field as illustrated above, or in the manufacture of bathroom fixtures, automotive, truck and tractor parts. So to cut *your* tubing costs, why not take this advice? For brass and copper tubing and fabricated parts that will *last,* see your nearby H & H representative *first.*

Think of H&H *First*

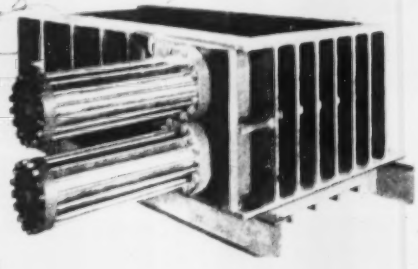
METALFLO
(BRAZED)

METALFLO is fabricated in O.D.'s of ¼" through 1¼" in wall thicknesses of .035" and lighter. It is also available in cut or random lengths, or formed to your specifications.

H&H TUBE AND MANUFACTURING COMPANY
255 North Forman Avenue. Detroit 17
Originators and sole makers of "Metalflo"—the economy tubing



METALFLO LOCKSEAM COIL STRIP AND SEAMLESS TUBING TUBULAR PARTS



D & J PRESS CO. LINES THEIR BALING PRESSES WITH SPEED TREAT STEEL PLATE TO STAND THE GAFF!

D & J Press Co., Inc., Buffalo, N. Y., builds scrap baling presses large enough to take an automobile and compress it into a bale 2' x 2' x 5', weighing about 1-ton. The charging box is 6' wide, 5' deep, 14' long. Compression, from one end and one side, is furnished by two 14", 2,000 lb. cylinders and two 17", 2,000 lb. cylinders. Construction is welded heavy boiler plate. Charging box and platens are lined with ¾" SPEED TREAT (X1545) open hearth, medium carbon steel plate — selected because it is so easy to machine (in this case, drilling holes), and because it ably resists abrasion and impact. In this application the SPEED TREAT plate has a tendency to work-harden and resists gouging.

SPEED TREAT Steel, one of the Speed Steels, has remarkable physical properties — speeds machining, increases tool life, readily polishes to a high lustre, suited to flame or induction hardening and other treatment — widely used for machine parts, hardened gears and sprockets, rubber molds, short run blanking dies, etc. Consult your nearest distributor.

SPEED STEELS

W. J. HOLLIDAY & CO.

SPEED ALLOY • SPEED CASE • SPEED TREAT

DISTRIBUTED BY

Brown-Wales Co., Cambridge-Hartford-Auburn, - Bridgeport Steel Co., Milford, Conn. Beals, McCarthy & Rogers, Buffalo, N. Y. - Burger Iron Co., Akron, Ohio - Grammer, Dempsey & Hudson, Inc., Newark, N. J. - Earle M. Jorgensen Co., Los Angeles-Houston-Oakland-Dallas - Passaic County Steel Service, Inc., Paterson, N. J. - Peckover's Ltd., Montreal-Toronto - Peninsular Steel Co., Detroit, Mich. - Pidgeon-Thomas Iron Co., Memphis, Tenn. - Horace T. Potts Co., Philadelphia-Baltimore-York, Pa.

Produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division, Hammond, Indiana. Plants: Hammond and Indianapolis, Indiana

NEW PRODUCTS and equipment

nonmagnetic container. This container is suspended from a fabricated steel arm whose length varies to suit depth of container in which the parts are located. Prab Conveyors Inc., Dept. ST, 19875 Mack Ave., Detroit 26, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Single-Spindle Bar Machine

. . . job changes in 1¾ hours

Model 126 single-spindle bar machine can be used in the turret lathe department or screw machine line. It has sufficient speed for aluminum and strength for high-temperature alloys. Machine can be changed from one average job to another in about $1\frac{3}{4}$ hours. Its

four standard cross slide cams cover all desired cross slide feeds. Universal turret cam provides infinite variation in cross strokes up to $6\frac{3}{4}$ inches and preselection of 10 automatically changed turret feeds.

Program drum or central control station governs cutting off, unchucking and stock feed stroke operation. The five shifter arms on the program drum preselect any one of 10 possible different turret feed gear ratios in the automatic transmission. New Britain Machine Co., Dept. ST, New Britain, Conn.

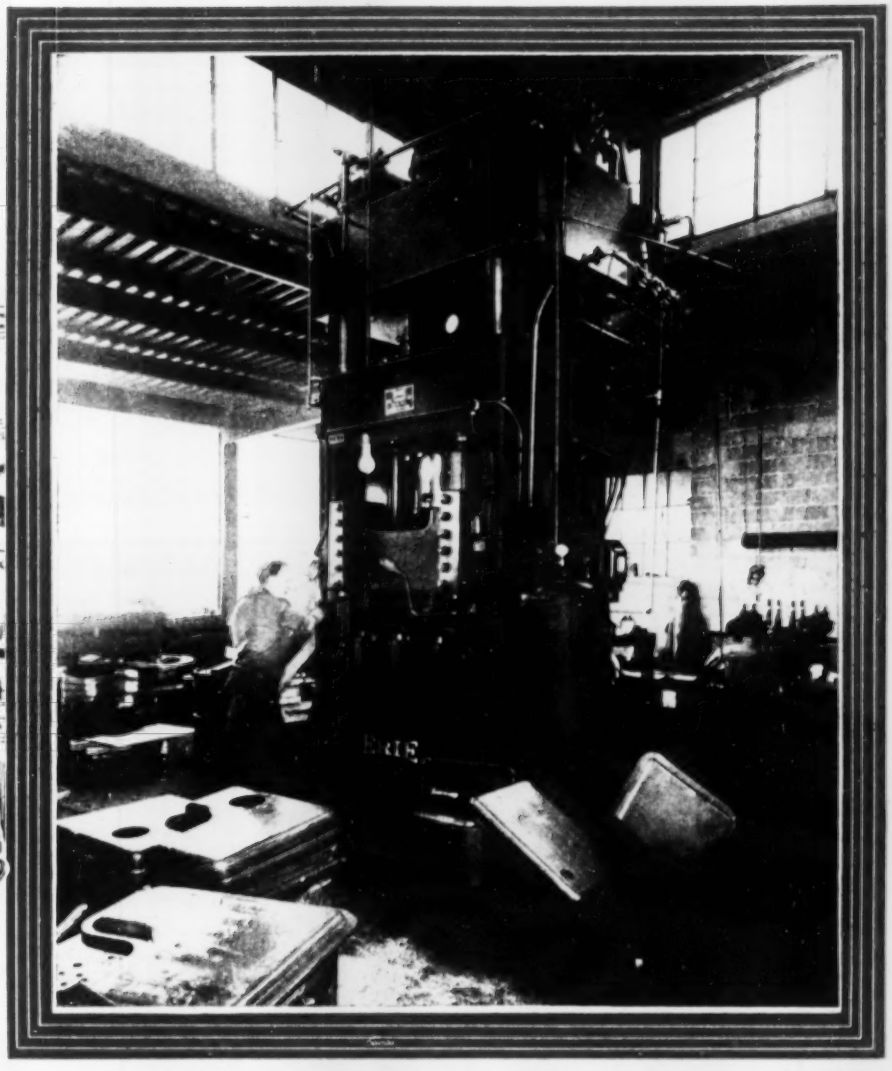
FOR MORE DATA—CIRCLE REPLY CARD NO. 11

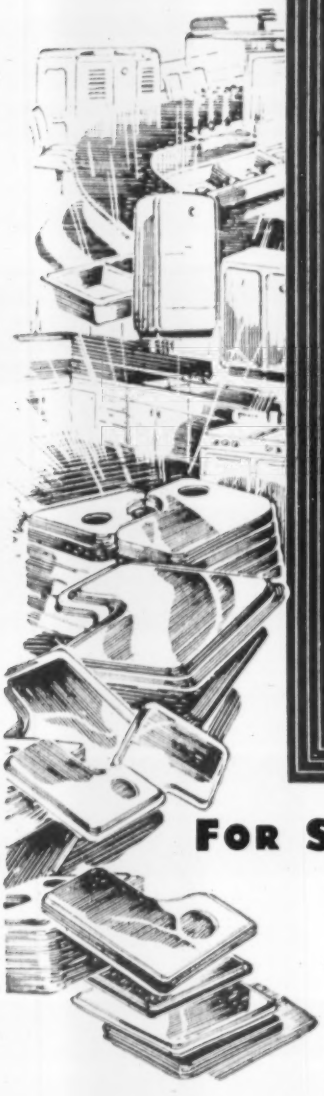
Self-Indexing Bed Turret

. . . greater tool clearance

Self-indexing bed turret's tilt-head design makes it possible to swing tools as large as 6 inches diameter over the ram and gives working travel of $7\frac{1}{4}$ inches. Repeating accuracy is assured by a tapered locating pin that works in a sleeve bearing and locates in a mating seat.

One feature of the turret is its





FOR SPECIAL METAL FORMING PRESSES...
CONSULT WITH US...

TYPICAL of many Hydraulic Presses built to customer specifications by Erie Foundry Company is this 500 ton metal forming press operating in the plant of a large eastern manufacturer. The importance of sound design and rugged construction becomes equally evident on production cost sheets whether the equipment is highly specialized or standard. For this practical reason special precision hydraulic presses by Erie Foundry Company are widely preferred. You are assured of the results you want when you take advantage of the half century of experience represented in Erie Foundry Company presses. Write for bulletin 350.

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More equipment rusts out than breaks down. Corrosion is a destructive force that every user of fastenings faces.

Many manufacturers today have found that fastenings by Harper mean longer life for equipment, better appearance, well-satisfied customers—because they resist corrosion.

The H. M. Harper Company is the world's largest exclusive producer of fastenings in brass, naval bronze, silicon bronze, monel, nickel, aluminum and all stainless steels. Over 7,000 items in these metals are carried in stock, bringing the advantage of a single source of supply for all fastenings.

Harper distributors are located in all market areas, and back of these distributors is a complete metallurgical and engineering service, ready to assist in solving any corrosion problem.

THE H. M. HARPER COMPANY
8207 Lehigh Avenue, Morton Grove, Illinois

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SPECIALISTS IN FASTENINGS

to solve corrosion problems

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EVERLASTING FASTENINGS
BRASS • SILICON BRONZE • NAVAL BRONZE • MONEL • ALUMINUM • STAINLESS STEEL

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for sound, clean welds!

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Offset Tip, Type D

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WELDING TIPS

Through the development of special cold forming equipment and methods, Weiger-Weed produces offset welding electrodes with these important advantages:

- No loss of physical or electrical properties—cold formed offset tips have the same hardness and conductivity as straight tips.
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- Economy, quick delivery—most styles are formed quickly from standard straight tips.

Many other special cold formed electrodes to lick difficult clearance problems can be worked out by WW if quantities warrant the tooling. Give us the details of your problem.

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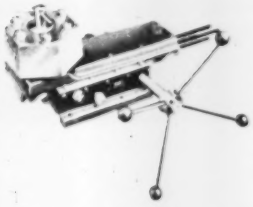
NEW PRODUCTS and equipment

long working stroke with short minimum index stroke. Through clutch arrangement, indexing can be done manually or automatically. The turret is designed for most 10, 11 and 12-inch lathes. A. K. Tool Co., Dept. ST, 2029 Blake Ave., Los Angeles 39, Calif.



FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Steel Corner Guard

. . . protects products, equipment

Corner guard is employed to protect stored material and handling equipment from damage. The guard is adaptable to all types of storage on skids, pallets, floors, etc.

It is constructed of heavy gage steel with brilliant black and yellow lithograph finish, in accordance with National Safety Council standards. It is constructed with a reinforced gusset plate on the back so it can slide directly under the load. This also serves to prevent it from falling. Randolph Metal Products Co., Dept. ST, 3843 W. 43 St., Chicago 32, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Boiler System Treatment

. . . cuts scale and corrosion

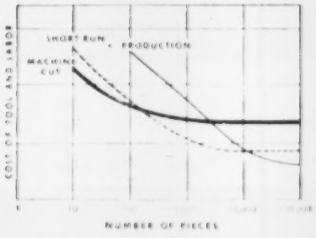
Scale and corrosion, major operational problems common to steam boilers are said to be eliminated by a caustic extraction treatment. Called Borgana, the treatment

STAMPINGS

Our impartial use of three basic methods gives you economy regardless of length of run.

Most parts can be made by all three methods. But only **one** is **most** economical. The right decision is a technical one, based on **over-all** quantity, contour dimensions, tolerances and materials.

YOUR SUPPLIER SHOULD KNOW ALL THREE METHODS



This logarithmic chart shows the effect of these factors on the specific part illustrated. From 1 to 150 parts, our own **Machine-Cut Method** with no die cost whatsoever is most economical. At 150 parts, the **Short-Run Method** using economical blanking dies and stock punches is best. At 10,000 units, the standard **Production Method** with standard dies is most satisfactory.

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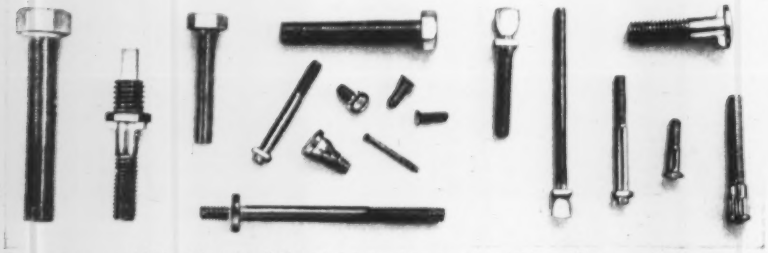
BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Silicon bronze cold headed and roll threaded fastenings are dependable in service and economical to fabricate — courtesy Scovill Mfg. Co., Waterville, Conn.

SILICON BRONZE FASTENINGS
Meet High Engineering Requirements

Vital equipment and, in fact, life itself may depend upon the reliability of metal fastenings used. Consequently, it is absolutely necessary from an engineering standpoint that the metal, from which fastenings are made, be reliable and dependable under the various service conditions encountered such as high stresses, corrosive environments of various kinds, moisture, fatigue, temperature changes, etc.

For all-around general engineering requirements for making cold headed items, Silicon Bronze 609 wire is widely used. It contains about 98% copper and 2% silicon and has the fine corrosion resistance and the workability of copper plus the strength and toughness of some grades of steel. Since they are not whittled away by rust, silicon bronze articles retain their original physical properties.

Resists Stress Corrosion Cracking

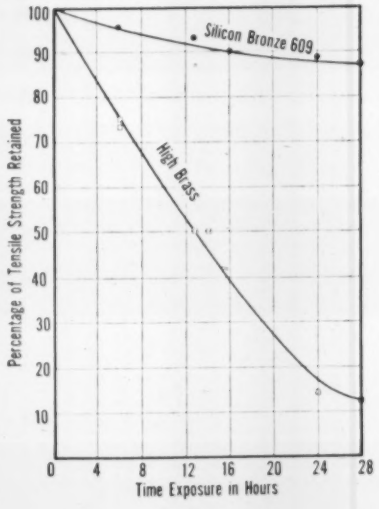
Silicon bronze is much more stable than the yellow brasses as far as resistance to stress corrosion or season cracking is concerned because of its very high copper content.

The chart shows the comparative behavior of accelerated stress corrosion tests on Silicon Bronze 609 versus yellow brass. The samples, while under tension, were immersed in concentrated ammonium hydroxide vapors. Tested after a 24-hour period, the silicon bronze had retained 87% of its tensile strength. Any loss was due to the reduction in cross-sectional area from the corrosive action of the solution. On the other hand, the yellow brass had cracked badly and only 12% of its original tensile strength remained.

This laboratory test is, of course, much more severe than encountered in actual service. It indicates that Silicon Bronze 609 is suitable for outdoor service conditions but yellow brass, under stressed conditions in the same environment, is not recommended.

Although Silicon Bronze 609 is moderately strong in the annealed condition (about 43,000 psi), it attains a very high tensile strength when hard drawn to the temper suitable for making screw products by cold forging and roll threading. The hard drawn wire is extremely malleable and is excellent for making cold headed products even with very large heads. No relief anneal is necessary for the finished products because the metal does not become brittle even after a high degree of cold working.

STRESS CORROSION TESTS — COMPARISON BETWEEN SILICON BRONZE AND YELLOW BRASS



Making a Cap Screw with an Oversized Head

The first operation reduced the .340" wire to .276" by "extrusion." This cold working operation not only increased the strength of the shank but pushed up extra stock required in order to fill the die for the large head. Extrusion and thread rolling increased the tensile strength of the shank to about 100,000 psi as compared with an ordinary low carbon steel screw which averages about 70,000 psi.

Steps for making a silicon bronze cap screw with an unusually large head — Scovill Mfg. Co.

The cold heading and roll threading processes have many advantages both from quality and economy standpoints — great strength, uniformly high quality, close tolerances, high speed manufacture, and very low scrap generation during fabrication.

Many Applications

Silicon bronze fasteners and special cold headed parts, as illustrated above, can be used to advantage for practically every product in every industry. Examples are: common bolts and nuts; clamps and special fastenings for high-tension and standard voltage electrical transmission equipment; builders', marine and pole line hardware; home appliances, outdoor signs, transit systems, automotive accessories, valve stems, instruments, water meters, signal systems, mine equipment, etc., etc.

More detailed information on wire alloys for cold heading is given in the Bridgeport Brass "Technical Handbook." Please contact Bridgeport's nearest sales office for laboratory help and your metal requirements. (9648)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

Alloy Composition vs. Sodium Hydroxide Solution Containing Hydrogen Sulfide

In last month's column we showed that the corrosion resistance of the copper-zinc alloys towards sodium hydroxide solutions containing hydrogen sulfide increased with increasing zinc content and other alloying elements.

The corrosion resistance of the copper-nickel alloys increases with decreasing copper content. The effect of nickel is approximately the same as for an equivalent amount of zinc (see curve in Feb. 1953 issue).

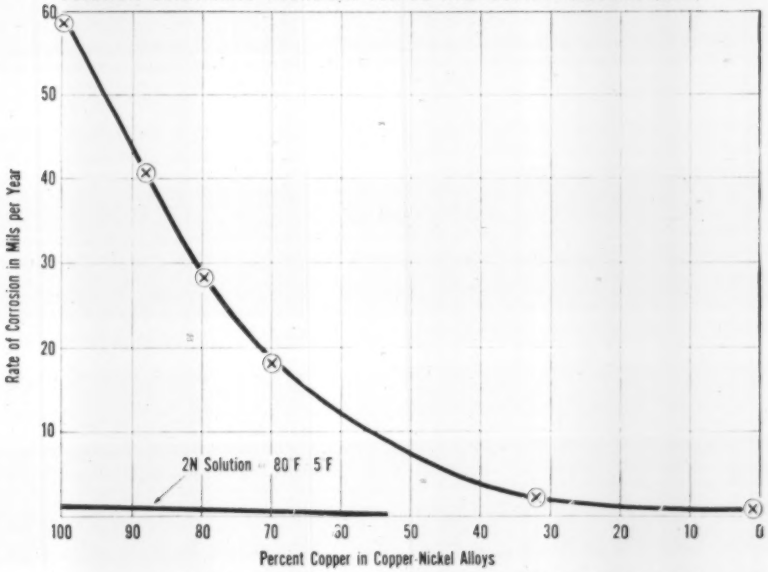
These laboratory data clearly show that the 70 copper 30% nickel alloy is much more resistant to the action of hydrogen sulfide in this alkaline solution as compared with alloys containing a higher percentage of copper. These data are in agreement with existing service and field data comparing 70-30 Copper-Nickel alloy with 80-20 and 90-10 Copper-Nickel alloys in liquors and vapors containing sulfides.

In the absence of hydrogen sulfide in sodium hydroxide solutions, the rate of corrosion of the copper-nickel alloys is considerably lower than shown in this curve. A test conducted in hot caustic liquors containing 10 to 50% sodium hydroxide and 5 to 16% sodium chloride showed that 70-30 Copper-Nickel alloy corroded at a rate of approximately .0002 ipy. In the same environment an 83-17 Copper-Nickel alloy corroded at a rate of .005 ipy.

It is evident from this information that the rate of corrosion of the Copper-Nickel alloys in sodium hydroxide solutions is influenced greatly by the presence of sulfides. Some of the variations in the corrosive action of sodium hydroxide encountered in service are due to the unrecognized influence of sulfides present even in small amounts.

It appears from the available test data that the corrosiveness of sulfur compounds towards copper and copper alloys decreases from hydrogen sulfide to the mercaptans. The mercaptans become progressively less corrosive with lengthening of the carbon chain with the 6 to 10 carbon chain mercaptans being very slightly corrosive. Aldehydes and other substances have been reported as being effective in reducing the corrosiveness of hydrogen sulfide towards copper and other metals.

CORROSION OF COPPER-NICKEL ALLOYS IN BOILING 0.8N SODIUM HYDROXIDE SOLUTION CONTAINING HYDROGEN SULFIDE AND SODIUM CHLORIDE (0.5N)



NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Air Vise, foot controlled, is said to have instant open and shut responses. Jaw opens to 3 inches, leaves operator's hands free for work. Gripping force is 15 times air line pressure. Unit is compact, can be bolted to any bench. **No. 1285**

Carbide Tool Sharpener uses inexpensive silicon carbide paper belt instead of scarce diamond materials. Belt is joined by patented process to avoid ridges. Method is claimed to cost about two thirds less than conventional methods per tool sharpened and to produce a longer lasting edge. Machine goes directly from rough ground to micro finishing stage in one operation and can grind any normal relief angle on cutting tool. **No. 1286**

Magnifying Spectacles for inspection or operations work where close tolerances are required or where eye strain is present, are said to employ same optical system as binoculars, give 2x magnification with clarity. **No. 1287**

Precision Hand Files are available in a kit containing eighteen units, from 0.009 to 0.072 in. thick. Tolerance is within 0.0004 to 0.0007 inches. They are said to be useful for precision slot filing, gap filing of electrical contacts and can be entered into locations inaccessible to thicker files. **No. 1288**

Conveyorized Grinding Machine operates at 6500 fpm, carries parts to be ground or finished in jigs or holders attached to heavy duty conveyor belt under grinding wheel. After grinding, machine dumps parts automatically into tote boxes. Wheel is reported to have adjustable drive to compensate for wear and maintain grinding speed and can be contour dressed to suit the operation. **No. 1289**

Baked Enamel Hammer Finish for metal products is said to adhere well, and it is chip and scratch resistant. Covers surface imperfections with one coat, does not require primer. Applied by spraying, it bakes for ½ hour at 300° F or for 1½ min. at 425° F. Available in a variety of colors in 5 gal. cans and 55 gal. drums. **No. 1290**

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BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities
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liquid is added at a rate of about 1 quart per 100 boiler horsepower per week on boilers under 400 psi.

The product is nontoxic to personnel, either internally or externally. In addition, it is noninjurious to metals, gaskets or packing materials and will not contaminate process materials. Treatment does not depend upon chemical reaction, but dissolves scale by detergent action. Secondary action is effective against corrosion, foaming and embrittlement. Strong, Carlisle & Hammond Co., Dept. ST, Cleveland 13, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Oil Fog Lubricator

. . . for air powered devices

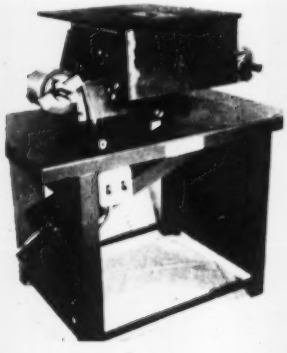
Micro-Fog lubricator for bearings, spindles, gear boxes and small air powered devices produces an extremely fine and uniform oil fog at low air flow. Its features include a constant oil level, 360 degree visibility of oil flow and accurate metering of oil delivery into air line to as little as one drop in 20 minutes by air control. C. A. Norgren Co., Dept. ST, Englewood, Colo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Packaging Machine

. . . forms, seals automatically

Auto-Pak packaging machine automatically forms two sheets of heat-sealing material around products, seals the four sides, cuts off and delivers a sealed package. The packager plugs into any ordinary light circuit, makes packages from



1-inch square by $\frac{1}{2}$-inch thick to 6 inches square from most heat sealing webs.

Attachments, including belt, turret and hopper, are available for automatic feeding. When products are hand fed, speed reaches 40 packages per minute. Automatic or semiautomatic feeding ups this rate and eliminates operator error. Pak-Rapid Inc., Dept. ST, 530 N. 21st St., Philadelphia 30, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Multiple-Action Scrubber

. . . controls stack dust

Multiple-action scrubber combines six different precipitation stages to control a wide range of stack dust. It is especially adapted to controlling emission from rotary dryers, cyclones, kilns, roasters, mixers and pulverizer exhausts. Important to efficiency and operating economy is the average draft loss about 2 inches of water column.

The scrubber is built in sizes for capacities from 1500 to 48,000 cfm. A recirculating system can be used

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...ON CARAVAN AXLES

Rutted ground or high grade highway . . . equipment mounted on CARAVAN axles is ready to roll over any surface. These quality-built assemblies assure positive trail at high speeds as well as stability for the heaviest equipment over the roughest ground.

CARAVAN axles feature double-acting spring cushioned draw bar to minimize stopping and starting shock, sturdy solid steel axle beam construction, extra-heavy center arm stop blocks and heavy-duty steering knuckle. Wide inside wheel turning angle assures maximum maneuverability and eliminates jack-knifing.

CARAVAN units are available as single-axle two-wheel assemblies and as four-wheel running gear equipped with automotive type steering. They are recommended for mounting military and industrial equipment as well as field service and construction machinery weighing up to 14,000 lbs.

Write today for the new Bulletin No. 53 for further information.

1169 I M

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STOPS SHAKES...PUTS PURR-R-R IN POWER

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When two large diesels roar into action, there can be plenty of vibration transmitted to all points. This was true on one installation . . . engine vibration created a regular power throb.

The answer was found in a length of Penflex four wall interlocked air jacketed exhaust tubing on each exhaust. The flexibility of the tubing absorbed the vibration . . . put a purr in power. At the same time it achieved a circulation of air and efficient cooling action . . . prevented breakage due to thermal expansion.

Whether your problem is vibration of exhaust lines or air lines . . . the transmission of liquids, volatiles, granular material or coarse abrasive products, Penflex engineers will be glad to work with you in the application of tubing from $\frac{1}{8}$" I.D. on up. Penflex also manufactures barrel fillers, pneumatic rivet passers and a complete line of accessories and fittings.

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PENFLEX

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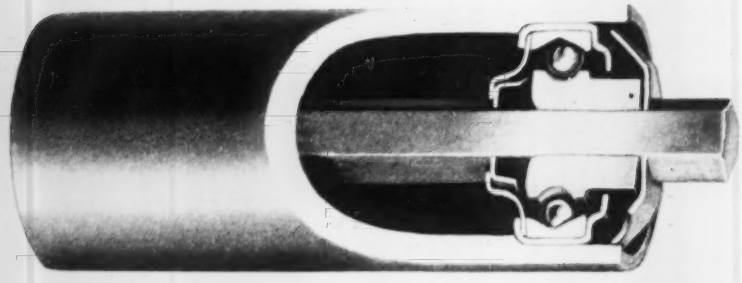
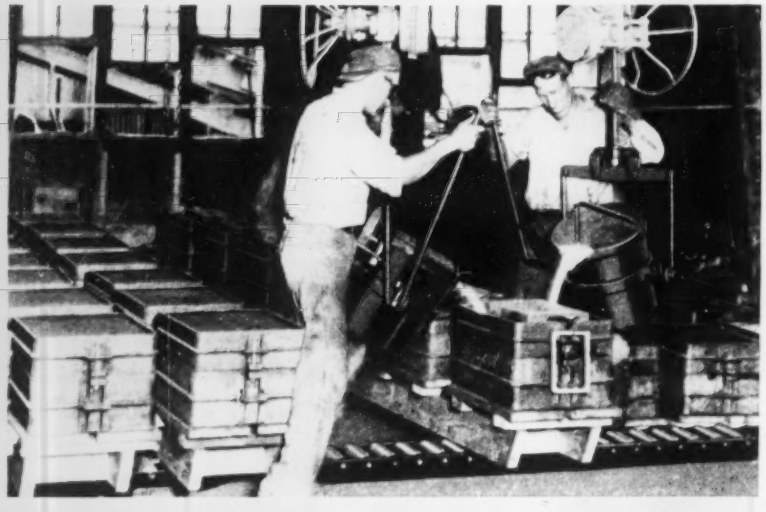
STANDARD'S SHIELDED BEARINGS

Are Expressly Designed for Foundry Conveyor Service





Every Standard roller conveyor is equipped with specially designed bearings that provide the maximum of protection and durability in foundry service. Spillage of hot iron is guarded against by special steel shields. These convex shaped shields fit into the ends of rollers to repel foreign matter. An exit for small particles is provided by an opening at bottom of shield.

Foundry conveyors are designed and built in their entirety by Standard—in a wide range of sizes, weights and types. You can depend on Standard for the right conveyor for your needs — we have been designing and building foundry conveyors since 1906.

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CONVEYORS

ENGINEERED FOR LOW-COST PRODUCTION

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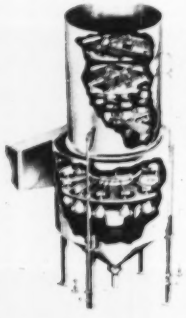
where water supply is a problem. For best results, the system requires about 2 gallons of water per minute at 40 to 50 psi for each 1000 cu ft of gas per minute. Cor-



rosion-resistant metal linings are installed where corrosion is a problem. Johnson-March Corp., Dept. ST, 1726 Chestnut, Philadelphia, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Welding Torch Mixer

. . . attached without wrench

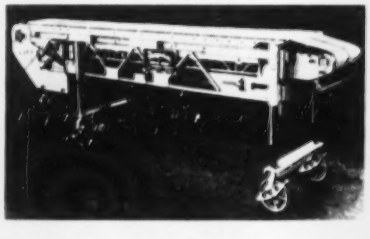
This welding torch mixer uses Gas-tite servene seating rings. The gasket type seating permits mixer to be attached to torch handle without using a wrench. Apparatus permits changing from welding to cutting or vice versa, using the same Torchweld handle. National Cylinder Gas Co., Dept. ST, 840 N. Michigan Ave., Chicago 11, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Adjustable Conveyor

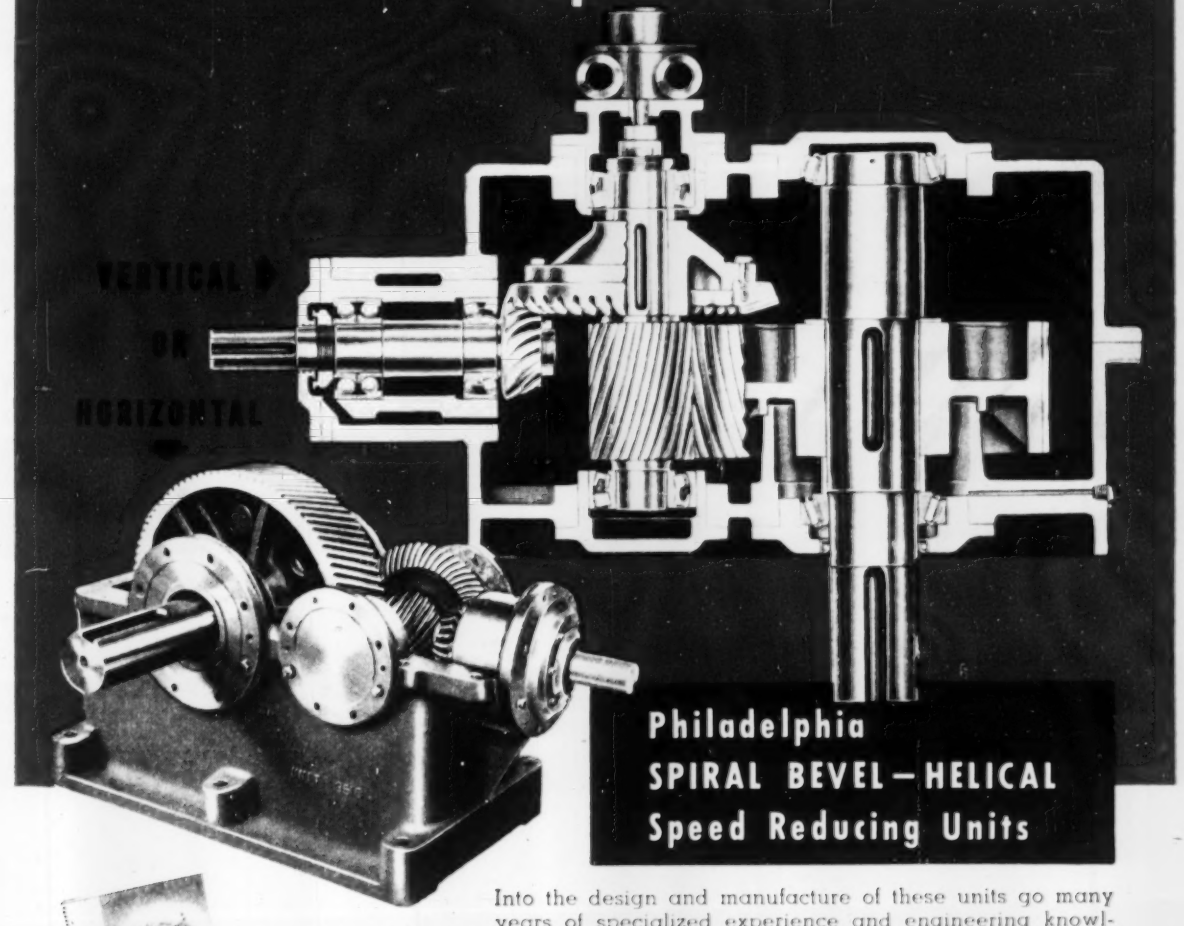
. . . many jobs in one area

Belt conveyor has extendable boom with overall 11-foot length when entirely retracted and 18-foot length fully extended. It is mount-



ed on four swivel casters and driven by a $\frac{3}{4}$-hp right angle worm and gearhead motor. Conveyor

Definitely designed for dependable service



Philadelphia SPIRAL BEVEL—HELICAL Speed Reducing Units

Available in single, double and triple reductions in standard ratios up to 238 to 1. Send for Catalog SB-50.

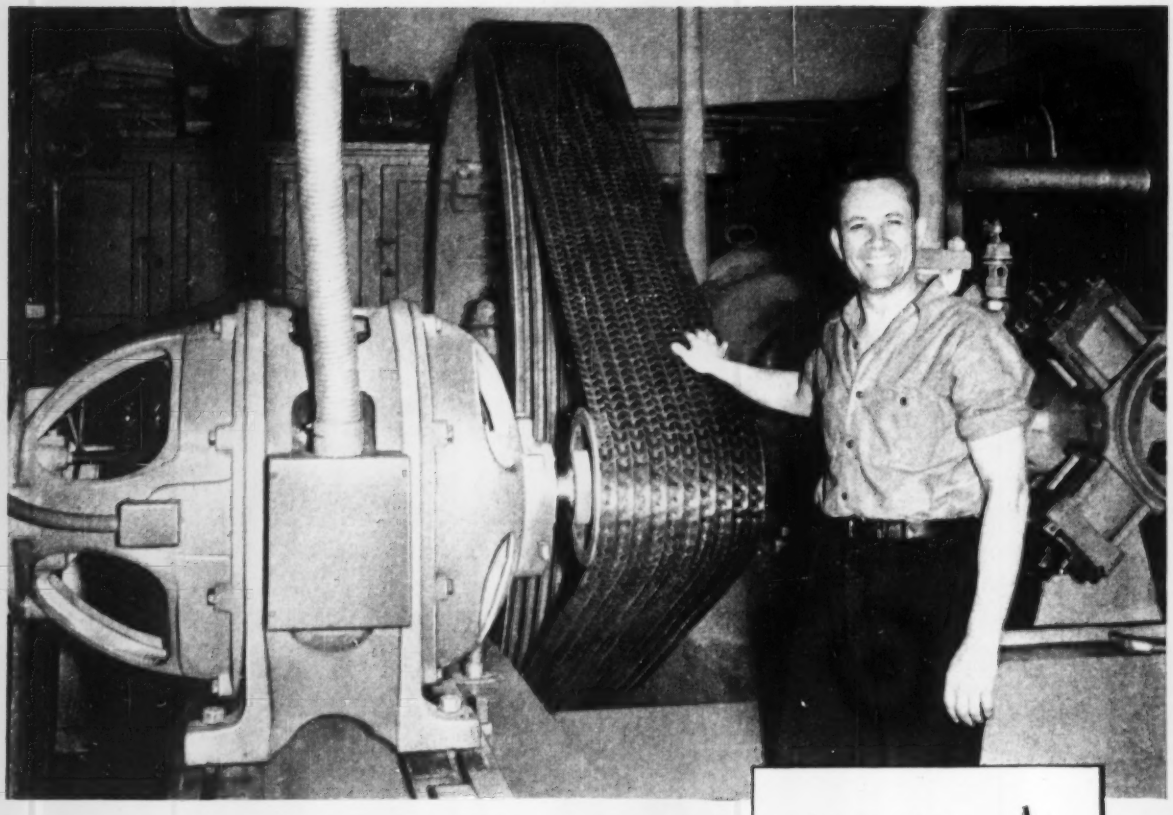
Into the design and manufacture of these units go many years of specialized experience and engineering knowledge. From the size and contour of the housings to the proper selection and placement of gears and bearings, greatest care is given to insure economical and reliable transmission of power with minimum maintenance. Indicative of advanced designing is the dry well construction which prevents oil-drip around the output shaft of the vertical unit.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

Industrial Gears and Speed Reducers
LimiTorque Valve Controls



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v-belt replacement takes up to 90% less time

Actual in-plant records prove that Veelos v-belt can be installed *and operating* in up to 1/10th the time regularly needed to do the same job using endless v-belts.

Matched sets of Veelos are quickly made up in your own stockroom or at the machine by just coupling the correct lengths for the particular drive. Even outboard bearing drives are no problem. You *never* remove these outboard bearings, because Veelos is installed by simply coupling it around the shafts and running it onto the sheaves. And maintaining adequate stocks of Veelos is practically automatic. A quick check of the Veelos 100-foot reel will tell the inventory story.

For full vibrationless power delivery, for fast adjustability to keep sets matched, for ease of controlling inventory and for quick, simplified replacement — standardize on Veelos.

Have you seen this Veelos Facts Book?

Your Veelos v-belt distributor's salesman will be glad to give you a quick trip through this fact-packed, 36 page book. You'll find it well worth the few minutes it takes. Next time the salesman calls, ask him to show it to you.

VEELOS
THE LINK
V-BELT

Write for a copy of the VEELOS DATA BOOK. It's fully illustrated and packed with useful engineering data. We'll be glad to send a copy along and you'll be glad to have it!

MANHEIM MANUFACTURING AND BELTING COMPANY
613 Manbel St., Manheim, Pa.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

belt speed reaches a maximum of 90 fpm.

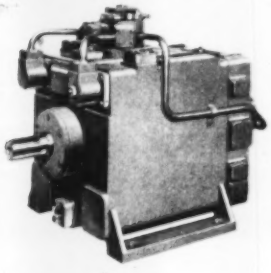
Extended conveyor portion is constructed with 2 x 2 x $\frac{1}{8}$-inch angle iron for carrying the top rollers. The truss is composed of $\frac{1}{2}$-inch diameter rods and the entire section is carried on twelve $1\frac{3}{4}$-inch diameter flanged rollers. Section will retract automatically when conveyor belt is allowed to run and latches are opened. A. B. Farquhar Division, Oliver Corp., Dept. ST, 142 N. Duke St., York, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Oil Hydraulic Pumps

. . . meet variable delivery need

Line of variable delivery hydraulic pumps is suitable for open or closed hydraulic circuits. They are particularly adapted to heavy machinery drives requiring precise torque control, acceleration and deceleration, speed or reversal. Hydraulic motors in the series are designed to reverse quickly under full load and to run at extremely slow speeds under full torque.



Units are available in ten sizes with capacities 28 to 2300 gpm at rated speeds, and 50 to 4000 hp in 2000 to 3000 psi pressure range. Waterbury Tool, division of Vickers Inc., Dept. ST, Waterbury 20, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Screw Locking Insert

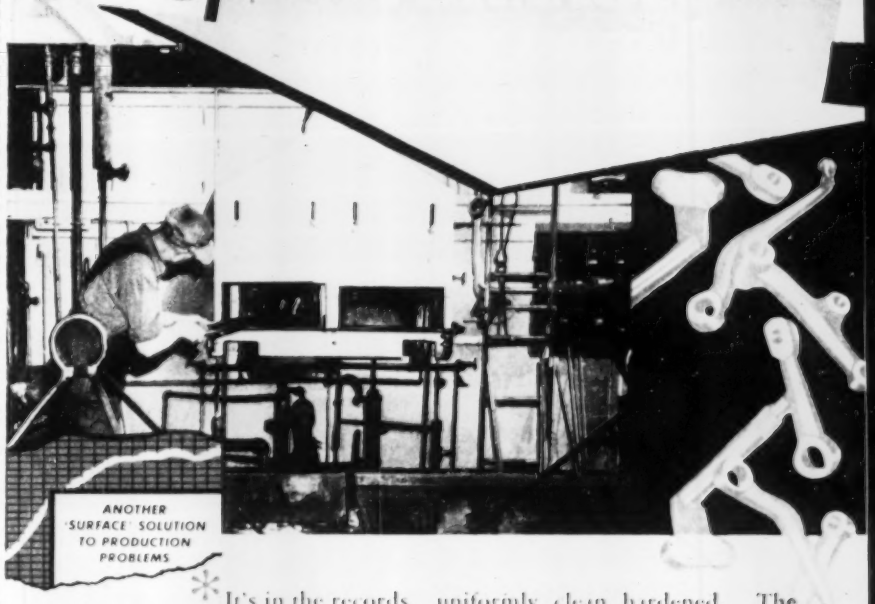
. . . make threads in blind holes

A knurled insert is available for providing threads in blind holes in all kinds of materials. It has a large band of diamond knurling on its grip area. Besides locking the screw, inserts require no special tools. Devices are made in a range of sizes to accept screws from 4-40

*high production

UNIFORM RESULTS

WHENEVER Surface ROTARY HEARTH FURNACES



ANOTHER 'SURFACE' SOLUTION TO PRODUCTION PROBLEMS

*It's in the records of many prominent companies with mass production schedules—versatile 'Surface' Rotary Hearth Furnaces measure up to the job with *profitable results*. The experience of Ross Gear & Tool Company, Lafayette, Ind. is typical. Here, the clean hardening of steering arms and lever shafts is required.

A 'Surface' Rotary Hearth Furnace equipped with radiant tubes and an RX prepared gas atmosphere does the job. Steering levers and shafts—*1,000 lbs. every hour*—are uniformly clean hardened. The furnace operates 24 hours a day, and during two years of continuous service, has never been down for repairs. Only one operator is required for the operation.

For controlled atmosphere or direct-fired heat treating processes, it will pay *real dividends* to check the outstanding advantages of 'Surface' Rotary Hearth Furnaces in your production picture.

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52100

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Largest Stocks in the Country

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DEPT. S. SPRINGFIELD ROAD
UNION, NEW JERSEY

Detroit, Mich. • Chicago, Ill.

NEW PRODUCTS and equipment

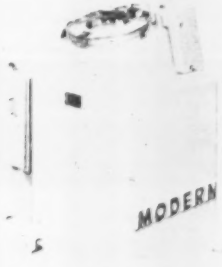
to 1/4-20. Brush Nail Expansion Bolt Co., Dept. ST, Greenwich, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Chamfering, Deburring Machine

. . . 8 seconds per ring gear

All the teeth in a 14-inch diameter 156-tooth flywheel ring gear can be deburred and chamfered in 8 seconds by the model BM-2029 Burr-Master. A locating finger, moving with the cutting tools, automatically locates the gear teeth radially on each stroke of form-



type cutting tools. This compensates for any out-of-round condition or flatness variation.

When cutting cycle is complete, a cycle indicator light signals, and the operator ejects the gear. Design features include alloy bronze rocker arms, an overload clutch that prevents damage to machine parts in event of accidental overloads and precision indexing mechanism operating in oil bath. Modern Industrial Engineering Co., Dept. ST, 14230 Birwood Ave., Detroit 4, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Adjustable Speed Drive

. . . offers stepless control

Simplified addition to the manufacturer's line of Thy-mo-trol packaged electronic adjustable-speed drives offers stepless speed control, close regulation and preset speed control. Drive is designed for use on such equipment as testing machines, conveyors, variable-volume pumps and machine tools. It is made $^3/_4$ to 3 hp drives.

Standard speed ranges are 5 to 1 and 20 to 1, in reversing and non-reversing forms. Dynamic brak-

STEEL PLATE WORK

TURBINE CASINGS and other heavy steel plate work are fabricated at Pusey jones of Hot Rolled, High Strength, Low Alloy Steel.

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Established 1848

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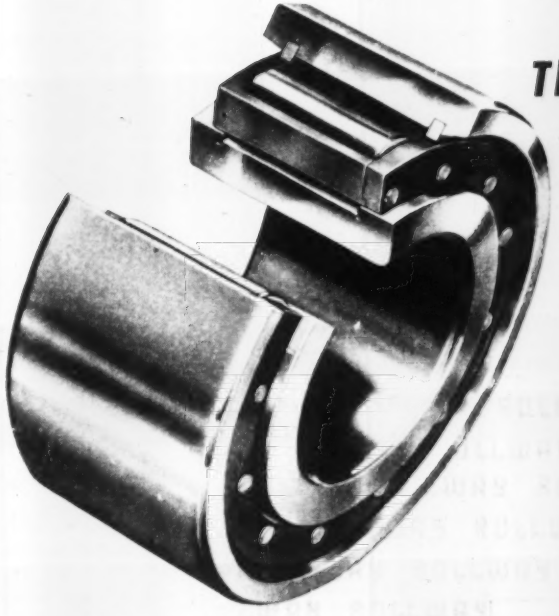

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RIGHT ANGLE

BEARING SURFACES with parallelism that results in unwavering right-line rolling.

RIGHT ANGLE

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Unwavering right-line rotation—free of skew, side-shock and end-rub—greatly extends the life expectancy of a Rollway Roller Bearing. Add to longer life the definite gains in smoother operation and lower maintenance costs and it's understandable why, today, demand for Rollways has reached a new peak.

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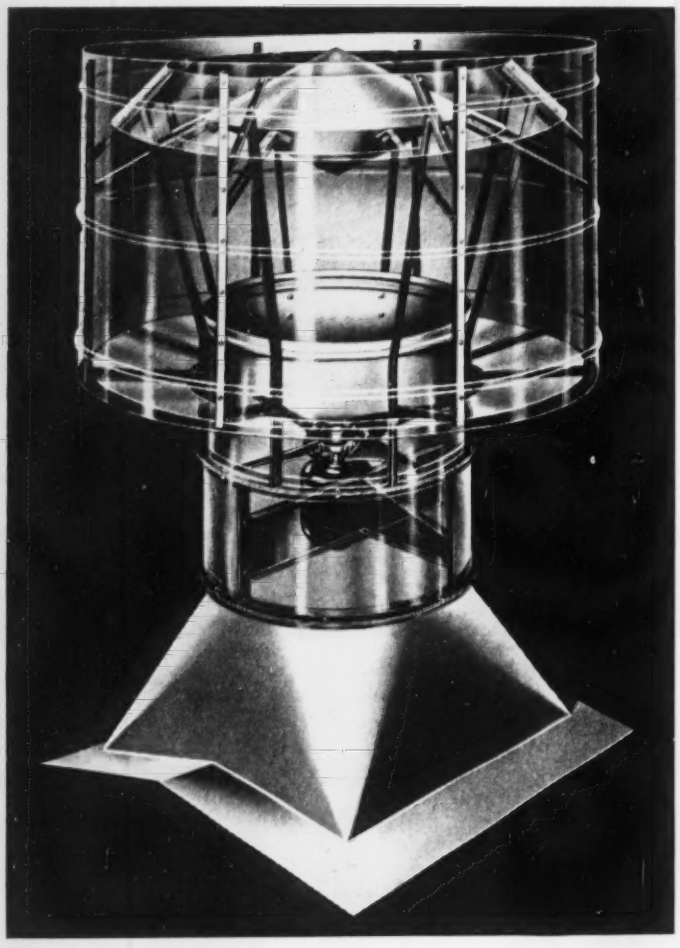


ENJOY ECONOMICAL TWO-WAY VENTILATION WITH BURT FREE-FLOW FAN VENTILATORS

Many structures do not require full time power ventilation. For them, Burt's Free-Flow Fan Ventilator is both economical and efficient because it supplies all normal exhaust needs by gravity. But, when greater exhaust is required, its Axial Flow Burt Airfoil Fan accelerates almost six times the removal of extra heat and impurities. It provides positive controlled ventilation. See Sweet's for further details or write for Bulletin SPV-10A.

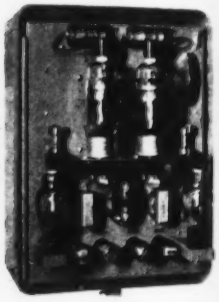
FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

905 So. High St. Akron II, Ohio

NEW PRODUCTS and equipment

ing, standard overload and undervoltage protection are two of the features included that are found on the firm's larger systems. Wide



speed range selection is accomplished by turning a single knob. General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO 23

Plating Processes

. . . use no nickel

Two decorative plating processes have been developed for use on parts commonly having a copper-nickel chrome finish. No nickel is used in the process. Designated as Probrite CR-723, both finishes can be deposited over steel or copper. Parts can be color buffed after plating. Promat Division, Poor & Co., Dept. ST, 851 S. Market St., Waukegan, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO 24

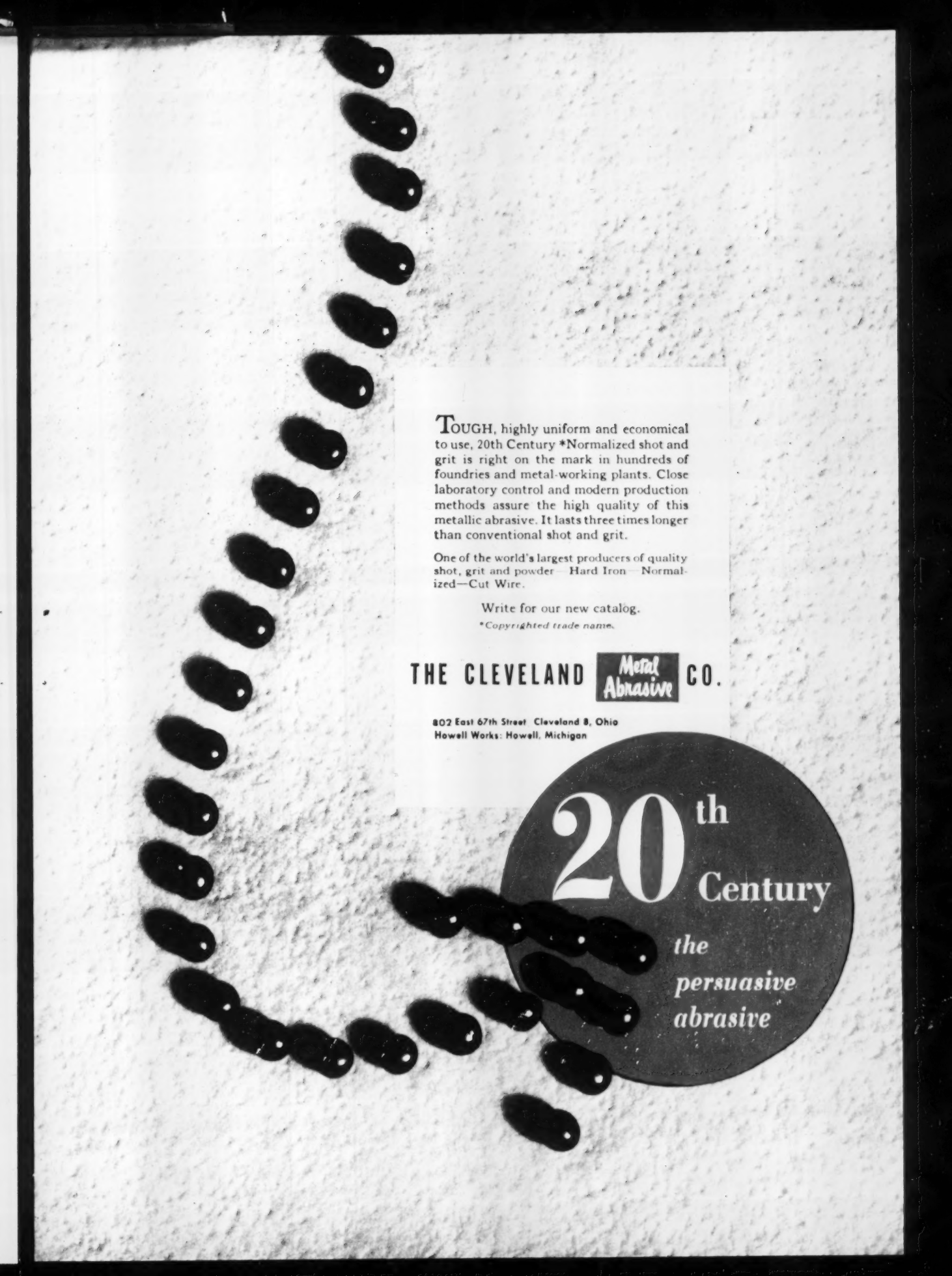
Automatic Sheet Lubricator

. . . speeds metal forming

This machine applies lubricants automatically to sheets and blanks, using the company's dry lubricant to reduce stock preparation costs and speed production in many met-

al forming operations. Material can be processed at speeds up to 55 fpm.

The machine includes three sep-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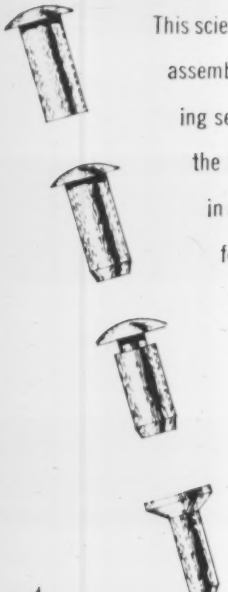

This scientific approach to product and parts assembly is a fastener-engineering consulting service which analyzes your needs at the blueprint stage...before you invest in expensive tools and dies! It projects for you the right fastener. Look into the economies of the "MILFORD METHOD" now. Send your blueprints and samples for analysis and planning by the "MILFORD METHOD", or write for the "Milford Method" brochure today.

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NEW PRODUCTS and equipment

arate units. In the first, sheets or blanks are cleaned. Stock then enters a self-contained coater with solution tanks that can handle blanks up to 48 inches wide. In the last stage, the stock is run through a drying element available with steam, gas or electrically-heated ovens. Gilron Products Co., Dept. ST, 6007 Euclid Ave., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

Suspension-Type Cutter

. . . provides 150 tons thrust

Suspension cutter, Guillotine model 25-EE, combines 150-ton thrust with relative mobility. The model will cut up to $2^{3}/_{4}$-inch diameter steel rod in 13 seconds. It is

also adaptable for riveting 1-inch cold rivets and for punching and pressing.

Two electric hydraulic pumps mounted in tandem produce the 150-ton thrust. The unit provides a 360-degree swivel. Cutting head weighs 470 pounds. Manco Mfg. Co., Dept. ST, Bradley, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 26

Screw Drivers

. . . blades from 12 to 1¼ inches

A line of screw drivers consists of patterns in round blades, square blades, Phillips style and stubbies. Blades are made of SAE chrome

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. Heavy Duty Drill

Kurt Orban Co.—Specifications and design features of German-made model BK-25 Alfing heavy duty drill press are contained in 4-page illustrated folder. Drilling capacity is 1 in. in mild steel, and spindle speed range is 150 to 1610 rpm.

70. Dust Collection

American Air Filter Co.—Reprint of paper "Operation, Application and Effectiveness of Dust Collection Equipment" contains charts on costs of equipment, range of particle sizes handled, concentrations, collector performances, list of practical "don'ts" and data on selection, installation and operation.

71. Lift Truck Scales

Martin-Decker Corp.—Description and specifications of scales for determining the weight of loads on any hydraulic type lift truck are contained in this 2-page illustrated data sheet. Weight of each load is read directly. Models range from 2000 to 18,000 lb capacity.

72. Piston Balancing Machine

Morris Machine Tool Co.—How the Morris automatic piston balancing machine works is described in 6-page illustrated brochure No. 60 PB. Series of photographs shows operation and close-up of various machine components. Specs are given.

73. Walkie Type Trucks

Moto-Truc Co.—Design features, specifications and illustrations of various models of battery operated walkie type trucks are found in 6-page bulletin No. 51. You'll never know there are so many different types for various uses until you read this.

74. Metallizing

Metallizing Co. of America—"Mogul Metallizing Gun" is title of 20-page illustrated booklet which discusses the use of this equipment for protection against corrosion, rebuilding worn parts and correcting mismachined products. Available metallizing gun models, auxiliary equipment, application techniques, case studies and related information are presented.

75. Ball Transfers

Mathews Conveyer Co.—General and specific data on construction and use of ball transfers is presented in 4-page folder BT 52. Transfers facilitate moving materials horizontally in any direction.

76. Pipe & Tube Straightening

Mackintosh-Hemphill Co.—Production experience records on straightening pipe and tubing in seven different plants are cited in technical bulletin 52. This 8-page illustrated booklet shows, in case study form, variety of methods and equipment for rotary straightening work.

77. Rectifier Welders

Miller Electric Mfg. Co.—Specifications for four models of Miller selenium rectifier direct current type welders are presented in this 4-page folder. Possible fields of application are outlined.

78. Rotating Parts Tester

Warren Brothers Roads Co., Mfg. Div.—Spintesting, the rotation of a part at high speeds to check mechanical perfection and vibration characteristics, is described and equipment for it illustrated in 4-page bulletin. Three models are covered, specs given and turbine rotor testing is outlined.

79. Magnesium Dockboards

Magnesium Co. of America—How light weight-heavy duty magnesium dockboards can speed and make safe loading and unloading at the shipping dock is shown in this 4-page illustrated folder. Ten photographs show them in action. The ramp-dockboard combination is described.

STEEL 3-9-53

Penton Building, Cleveland 13, Ohio

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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NEW PRODUCTS and equipment

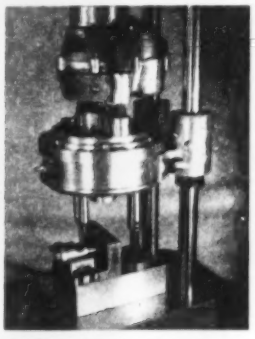
vanadium electric furnace steel. Blade lengths range from 12 to 1¼ inches. Utica Drop Forge & Tool Corp., Dept. ST, Utica, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 27

Multiple-Head Tapper

. . . lead screw protection

Multiple tapping of two or more small holes can be done with lead screw protection on any drill press with this self-contained lead screw multiple tapping unit. Work can



be done even though tap sizes, pitches, or both, are dissimilar.

The unit consists of a reversing head, a three-spindle multiple head and a fixture. It taps two 0-80 holes in aluminum. The lead screw, having a fast pitch, runs slower than the taps and is completely enclosed during operation. Etteo Tool Co. Inc., Dept. ST, 594 Johnson Ave., Brooklyn 37, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 28

Plastic Coating

. . . protects and identifies

Insulcolor is a plastic coating for use as both protection and color identification on insulated refrigerant, cold water, steam and other lines and insulated equipment. It will withstand temperatures to 160° F without cracking, shrinking or crazing. Armstrong Cork Co., Dept. ST, Lancaster, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 29

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Abrasive Belts

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber

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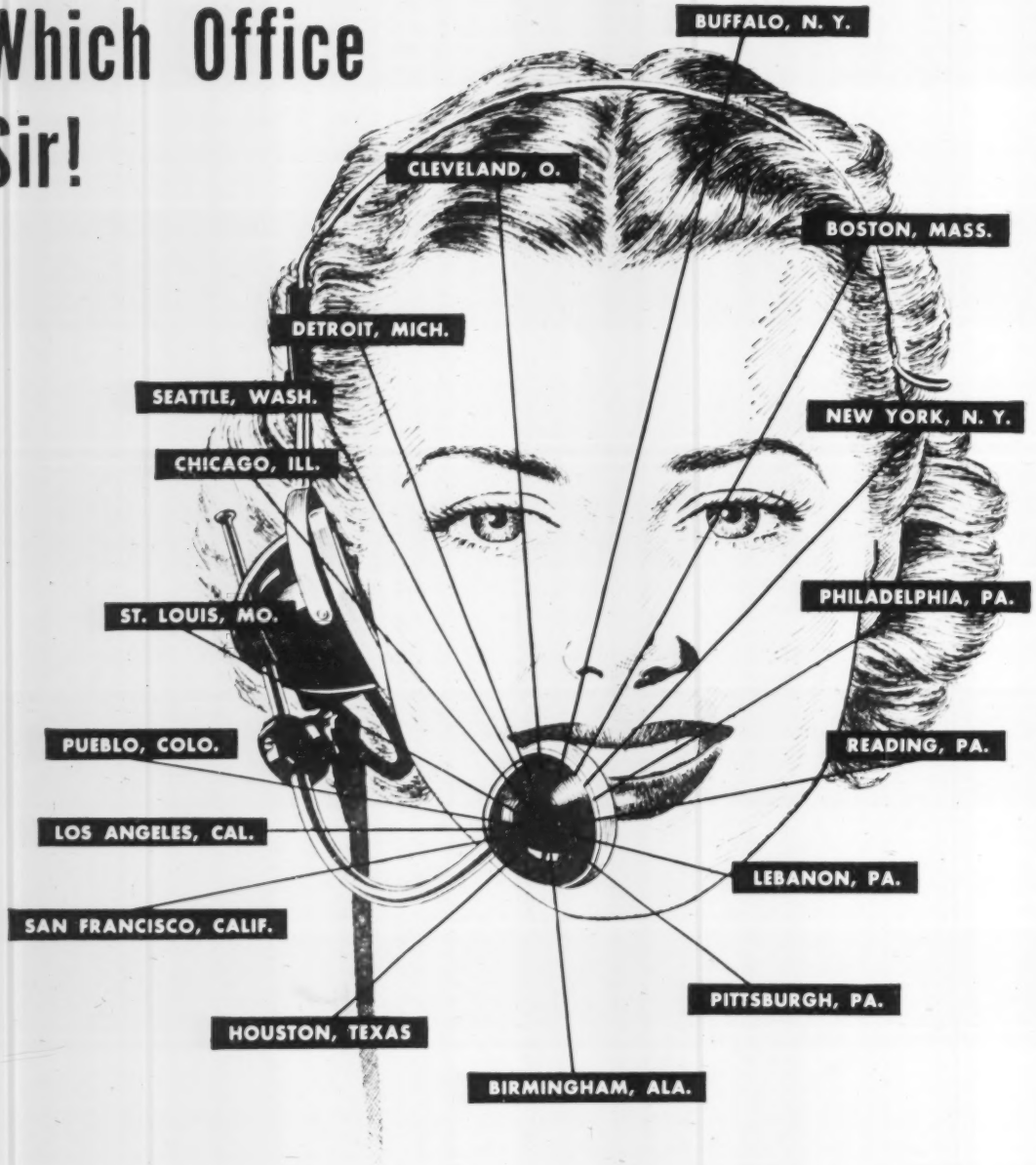
South Braintree 85, Massachusetts

Which Office Sir!



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The Market Outlook

THERE'S more of a peacetime look in the steel market now than there has been for a long time.

You can tell that from the way demand for light, flat-rolled steel is moving ahead of demand for the forms of steel, such as large bars and heavy plates, customarily in heavy need during war periods.

THE SCORE—This shouldn't be interpreted as any diminution in demand for steel for war and defense purposes. What's happening is this: Defense demand is remaining constant while demand for civilian usage is swelling.

This development became possible largely from the stabilizing of the defense program and the substantial increase in the steel industry's production capacity. Had the steel industry not increased its capacity in the last three years there would be little room for thinking in terms of additional steel for civilian purposes.

UPSURGE—Now that the government has open-ended the Controlled Materials Plan and is considering further decontrols for steel, various civilian goods industries, particularly the automobile producers, are upping their production schedules. Result: An upsurge in demand for the light, flat-rolled forms of steel that are characteristic in civilian goods.

STIMULATED—The intensified demand from producers of civilan goods is having a pronounced effect not only on major grades of hot-rolled and cold-rolled carbon sheets but also on enameling sheets and electrical sheets, such as are used in household appliances. About the only major sheet item not moving rapidly is galvanized sheets, particularly in the lighter gages, 24 to 28.

Reflecting the stronger tone in civilian durable goods, foundries are operating at higher levels to supply the needed castings. Iron supply for these foundries should remain adequate.

THOUGHTS ON DECONTROL—In preparation for further decontrol of the distribution of steel, government agencies were concerned last week with devising a system for giving priority to defense requirements after June 30, when the present controls are to expire. Under consideration were three systems: 1. A simole DO (defense order) rating band. 2. A little CMP. 3. A programming setup in which task forces from the steel, copper and aluminum industries would confer with the armed services, Atomic Energy Commission and other qualified claimants to ascertain requirements and parcel them out on the basis of capacity relationships of the various producers.

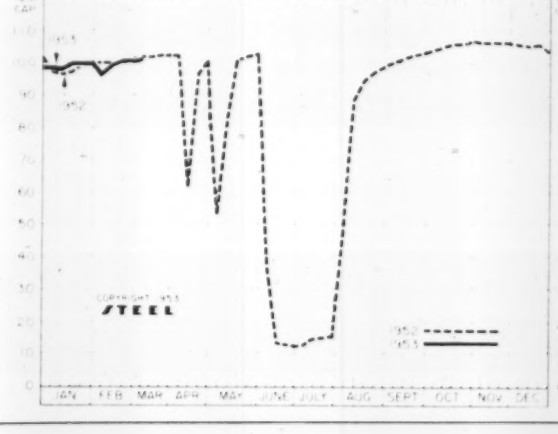
As these systems were being studied, it became known that Russian Premier Joseph Stalin was gravely ill and passing from actively heading the Russian state. First reaction was that there would be no relaxation in the United States defense effort but that decontrol would continue to shape up in accordance with earlier thinking.

RECORD BREAKING—The heavy steel production that is helping make decontrol possible pushed up to a record high in the week ended Mar. 7. It hit 101 per cent of capacity, and with capacity at an all-time high the yield was the greatest ever attained 2,277,000 net tons of steel for ingots and castings. The preceding week's rate was 100.5 per cent. The 101 per cent rate gives the long month of March a good start toward setting an all-time monthly high record of steel ingot production.

PRICES CUT—Even though demand for the major grades of steel is intense, the return of peacetime characteristics in the steel market is bringing an occasional price reduction. In the Boston area, competition forced leading producers to make a 10 per cent cut in prices of smaller sizes of electric welded carbon steel tubing.

Many buyers of steel ere becoming increasingly selective. They're not taking steel just because it is available. With increasing freauence they're insisting on getting just what they want and are refusing alternates. For instance, some consumers who need fairly heavy and wide plate are declining offers of narrower and lighter plate that comes from strip mills.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Mar. 7	Change	Same Week 1952	Same Week 1951
Pittsburgh	106.5	+ 5	103.5	101
Chicago	102.5	+ 5*	103	103.5
Mid-Atlantic	96	1	98	99.5
Youngstown	102	+ 1	104	105
Wheeling	101	0	108	96
Cleveland	101	0	99.5	103
Buffalo	106.5	0	104	104
Birmingham	95.5	0	101	75
New England	92	1	90	90
Cincinnati	101	+ 1	92	102
St. Louis	96	2	75	93
Detroit	103.5	0	102	105
Western	106.5	1.5	105	103.5
Estimated national rate	101	+	101.5	101

*Change from preceding week's revised rate.

Estimated rates are based on Jan. 1, 1953, capacities; others on Jan. 1, 1952, capacities.

Weekly steelmaking capacity is estimated at 2,254,150 net tons in 1953, 2,057,610 tons in 1952, 1,960,604 tons in 1951.

Composite Market Averages

FINISHED STEEL PRICE INDEX Bureau of Labor Statistics	Mar. 3 1953	Feb. 24 1953	Month Ago	February Average
1947-1949 = 100	130.5	130.5	130.6	130.5

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Mar. 3, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952

Rails	$3.775	Sheets, C.R. carbon	$5.275
Tracks spikes	6.650	Sheets, galv.	6.765
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.560
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.975
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted Calculated by STEEL*	Mar. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	134.56
Index in cents per lb	4.912	4.912	4.912	4.657	3.645

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished Steel, NT	$110.38	$110.38	$110.38	$106.32	$81.136
No. 2 Fdry. Pig Iron, GT	56.04	56.04	56.04	52.54	39.84
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.566
Malleable Pig Iron, GT	56.77	56.77	56.77	53.27	40.48
Steelmaking Scrap, GT	41.00	41.00	41.00	49.00	30.17

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Mar. 3 1953	Week Ago	Month Ago	Year Ago	5 Yr. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.402	4.402	4.402	4.225	3.50
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.15	4.15	4.15	3.915	3.095
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.925	3.925	3.925	3.75	2.90
Strip, H.R., Chicago	3.925	3.925	3.925	3.75	2.90
Strip, C.R., Pittsburgh	4.50-5.10	4.50-5.10	4.50-5.10	4.35-4.95	3.55
Strip, C.R., Chicago	4.50	4.50	4.50	4.35	3.55
Strip, C.R., Detroit	4.60-5.20	4.60-5.20	4.60-5.20	4.45-5.05	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED					
Billets, forging, Pitts.	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, ½-⅜", Pitts.	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton					
Bessemer, Pitts.	$58.00	$58.00	$58.00	$53.00	$40.50
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry. Pitts.	55.00	55.00	55.00	52.50	40.496
No. 2 Fdry. Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry. Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry. del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry. Birm.	51.38	51.38	51.38	49.88	37.88
No. 2 Fdry. (Birm.) del. Cin.	58.93	58.93	58.93	55.89	40.74
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt., E. Pa.	45.00	45.00	45.00	45.00	39.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt., Valley	44.25	44.25	44.00	44.00	40.25
No. 1 Heavy Melt., Cleve.	44.25	44.25	44.00	44.00	39.75
No. 1 Heavy Melt., Buffalo	42.75	42.75	43.00	43.00	44.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	49.75
No. 1 Cast, Chicago	43.00	43.00	43.00	49.00†	66.00

† F.o.b. shipping point

COKE, Net Ton					
Beehive, Furn., Connlsv.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry., Connlsv.	17.00	17.00	17.00	17.50	14.875
Oven, Fdry., Chicago	24.50	24.50	24.50	25.00	19.25

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38		
Birmingham R2	50.88	51.38		
Birmingham S9		51.38		
Woodward Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo R2	54.50	55.00	55.50	
Buffalo H1	54.50	55.00	55.50	
Tonawanda,N.Y. W12	54.50	55.00	55.50	
No.Tonawanda,N.Y. T5		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester,N.Y., del.	57.52	58.02	58.52	
Syracuse,N.Y., del.	58.62	59.12	59.62	
Chicago District				
Chicago I-S	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50		55.00	
IndianaHarbor,Ind. I-2	54.50		55.00	
So.Chicago,Ill. W14	54.50	55.00	55.00	
So.Chicago,Ill. Y1	54.50	55.00	55.00	
So.Chicago,Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.		61.50	61.50	
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50			55.50
Duluth I-3			55.00	
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1		59.50	60.00	
Fontana,Calif. K1	60.50	61.00		
GraniteCity,Ill. G4	56.40	56.90	57.40	
St.Louis, del. exc. tax	57.15	57.65	58.15	
Ironton,Utah C11	54.50	55.00		
Geneva,Utah C11	54.50	55.00		
LoneStar,Tex. I-6	50.50	*51.00	51.00	
Minnequa,Colo. C10	56.50	57.50	57.50	
Rockwood,Tenn. T3			58.50	
Pittsburgh District				
Nevillelsland,Pa. P6		55.00	55.00	55.50
Pitts., N&S sides Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Bessemer,Pa. U5	54.50		55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50			
McKeesport,Pa. N3	54.50			55.50
Monessen,Pa. P7	56.50			
Sharpsville,Pa. S6			55.00	55.50
Steelton,Pa. H2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-5	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	
Youngstown Y1	54.50	55.00	55.00	
Youngstown U5	54.50			55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton (Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G2 J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max P)	
NiagaraFalls,N.Y. P15	$61.00
Keokuk,Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry. 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton (Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mar. 3 prices quoted under GCPR as reported to STEEL, Mar. 3, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif. K1 ... 83.00
Houston S5 ... 65.00
Midland,Pa. C18 ... 57.00
Munhall,Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $59.00
ClairtonPa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 59.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
SoDuquesne,Pa. U5 ... 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 70.50
Canton,O. R2 ... 70.50
Clairton,Pa. U5 ... 70.50
Cleveland R2 ... 70.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.00
Ensley,Ala. T2 ... 70.50
Fairfield,Ala. T2 ... 70.50
Fontana,Calif. K1 ... 88.50
Gary,Ind. U5 ... 70.50
Geneva,Utah C11 ... 70.50
Houston S5 ... 78.50
Johnstown,Pa. B2 ... 70.50
Lackawanna,N.Y. B2 ... 70.50
LosAngeles B3 ... 88.50
Munhall,Pa. U5 ... 70.50
Seattle B3 ... 88.50
So.Chicago R2,U5,W14 ... 70.50
So.Duquesne,Pa. U5 ... 70.50
So.SanFrancisco B3 ... 88.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... 76.00
Buffalo R2 ... 76.00
Canton,O. R2 ... 76.00
Canton,O. T7 ... 78.60
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 79.00
Fontana,Calif. K1 ... 93.00
Gary,Ind. U5 ... 76.00
Houston S5 ... 84.00
Ind.Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 76.00
Munhall,Pa. U5 ... 76.00
So.Chicago R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... 87.50
Canton,O. R2 ... 87.50
Cleveland R2 ... 87.50
Fontana,Calif. K1 ... 105.50
Gary,Ind. U5 ... 87.50
Massillon,O. R2 ... 87.50
So.Chicago,Ill. R2 ... 87.50
So.Duquesne,Pa. U5 ... 87.50

SHEET BARS (NT)
Fontana,Calif. K1 ... 93.18

SKELP
Aliquippa,Pa. J5 ... 3.65
Munhall,Pa. U5 ... 3.75
Warren,O. R2 ... 3.75
Youngstown R2,U5 ... 3.75

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.325
Buffalo,W12 ... 4.325
Cleveland A7 ... 4.325
Joliet,Pa. A7 ... 4.325
Fairfield,Ala. T2 ... 4.325
Fontana,Calif. K1 ... 4.325
Houston S5 ... 4.725
Johnstown,Pa. B2 ... 4.325
Joliet,Ill. A7 ... 4.325
KansasCity,Mo. S6 ... 4.663
LosAngeles B3 ... 5.125
Minnequa,Colo. C10 ... 4.575
Monessen,Pa. P7 ... 4.325
No.Tonawanda,N.Y. B11 ... 4.325
Pittsburg,Calif. C11 ... 4.975
Portsmouth,O. P12 ... 4.325
Roebling,N.J. R5 ... 4.425
So.Chicago,Ill. R2 ... 4.325
SparrowsPoint,Md. B2 ... 4.425
Sterling,Ill.(1) N15 ... 4.325
Struthers,O. Y1 ... 4.325
Torrance,Calif. C11 ... 5.125
Worcester,Mass. A7 ... 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.50
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind.Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S5 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif.(22) P1 ... 4.56
Phoenixville,Pa. P4 ... 4.95
Seattle B3 ... 4.50
So.Chicago,Ill. U5,W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10

Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 5.05
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 3.80
Bessemer,Ala. T2 ... 3.80
Bethlehem,Pa. B2 ... 3.80
Clairton,Pa. U5 ... 3.80
Fairfield,Ala. T2 ... 3.80
Fontana,Calif. K1 ... 4.45
Gary,Ind. U5 ... 3.80
Geneva,Utah C11 ... 3.80
Ind.Harbor,Ind. I-2 ... 3.80
Ind.Harbor,Ind. Y1 ... 4.30
Johnstown,Pa. B2 ... 3.80
Lackawanna,N.Y. B2 ... 3.80
LosAngeles B3 ... 4.35
Munhall,Pa. U5 ... 3.80
Seattle B3 ... 4.40
So.Chicago,Ill. U5 ... 3.80
So.SanFrancisco B3 ... 4.30
Struthers,O. Y1 ... 4.30

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ... 3.80
Lackawanna,N.Y. B2 ... 3.80
Munhall,Pa. U5 ... 3.75
So.Chicago,Ill. U5 ... 3.75

BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 3.95
Bessemer,Ala. T2 ... 3.95
Clairton,Pa. U5 ... 3.90
Cleveland J5, R2 ... 3.90
Conshohocken,Pa. A3 ... 4.20
Ecorse,Mich. G5 ... 4.00
Fairfield,Ala. T2 ... 3.95
Fontana,Calif.(30) K1 ... 4.65
Gary,Ind. U5 ... 3.95
Geneva,Utah C11 ... 3.95
Ind.Harbor,Ind. I-2 ... 3.95
Ind.Harbor,Ind. Y1 ... 4.45
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFran.Calif. B2 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

PLATES, Open-Hearth Alloy
Cleveland J5, R2 ... 4.25
Conshohocken,Pa. A3 ... 4.75
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 4.25
Johnstown,Pa. B2 ... 4.25
Munhall,Pa. U5 ... 4.25
Sharon,Pa. S3 ... 4.25
So.Chicago,Ill. U5 ... 4.25
SparrowsPoint,Md. B2 ... 4.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind.Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,Ky.(15) A10 ... 4.15
Cleveland,o.l. R2 ... 4.50
Warren,O.,o.l. R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.90
Aliquippa,Pa. J5 ... 3.90
Ashland,Ky.(15) A10 ... 3.90
Bessemer,Ala. T2 ... 3.90
Claymont,Del. C22 ... 4.35
Cleveland J5, R2 ... 3.90
Coatesville,Pa. L7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.90
Fontana,Calif.(30) K1 ... 4.55
Gary,Ind. U5 ... 3.90
GraniteCity,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.90
Harrisburg,Pa. C5 ... 6.50
Houston S5 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.90
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Minnequa,Colo. C10 ... 4.70
Munhall,Pa. U5 ... 3.90
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Steubenville,O. W10 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.90

PLATES, Carbon A R
Fontana,Calif. K1 ... 5.70
Geneva,Utah C11 ... 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.50
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFran.Calif. B2 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta,A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco,S7 ... 5.00

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 ... 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.65
Buffalo R2 ... 4.65
Canton,O. R2 ... 4.65
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.65
Detroit R7 ... 4.85
Ecorse,Mich. G5 ... 5.02
Fairfield,Ala. T2 ... 4.65
Fontana,Calif. K1 ... 5.22
Gary,Ind. U5 ... 4.65
Houston S5 ... 5.00
Ind.Harbor,Ind. I-2,Y1 ... 4.65
Johnstown,Pa. B2 ... 4.65
KansasCity,Mo. S5 ... 5.25
Lackawanna,N.Y. B2 ... 4.65
LosAngeles B3 ... 5.25
Massillon,O. R2 ... 4.65
Midland,Pa. C18 ... 4.65
So.Chicago,Ill. R2,U5,W14 ... 4.65
So.Duquesne,Pa. U5 ... 4.65
Struthers,O. Y1 ... 4.65
Warren,O. C17 ... 4.65
Youngstown U5 ... 4.65

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind.Harbor,Ind. I-2 ... 5.925
IndianaHarbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.675
Struthers,O. Y1 ... 6.425
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B6 ... 4.975
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago B6 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.075
Donora,Pa. A7 ... 4.925
Elyria,O. W8 ... 4.925
Franklin Park,Ill. N5 ... 4.925
Gary,Ind. B2 ... 4.925
GreenBay,Wis. F7 ... 4.925
Hammond,Ind. L2,M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles B2 ... 6.375
Mansfield,Mass. B5 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. M4 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Wankegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B6 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.95
Carnegie,Pa. C12 ... 6.00
Chicago B6 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.05
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Donora,Pa. A7 ... 6.05
Elyria,O. W8 ... 6.00
Gary,Ind. B2 ... 6.00
Hammond,Ind. L2, M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B5 ... 6.45
Massillon,O. R2, R8 ... 6.00
Milford,Pa. C18 ... 6.00
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
Pittsburgh J5, P2, W14 ... 6.00
Spring City,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Wankegan,Ill. A7 ... 6.00
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.90
Alton,Ill. L1 ... 4.50
Buffalo R2 ... 3.90
Cleveland R2 ... 3.90
Joliet,Ill. A7 ... 4.70
Fairfield,Ala. T2 ... 3.90
Fontana,Calif. K1 ... 4.95
Gary,Ind. U5 ... 3.90
Ind.Harbor,Ind. I-2, Y1 ... 3.90
Kansas City,Mo. S5 ... 4.50
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.70
Monessen,Pa. P7 ... 4.00
Niles,Calif. P1 ... 4.70
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.00
So.Chicago,Ill. U5 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.00
Williamsport,Pa. S19 ... 4.00
Youngstown U5, Y1 ... 3.90

BARS, Reinforcing (Fabricated to consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ¾-1" B2 ... 5.25
KansasCity S5 ... 6.05
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.25
Seattle B3, N14 ... 5.80
SandSprings S5 ... 6.45
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¾-1" B2 ... 5.25
Williamsport,Pa. S19 ... 5.30

RAIL STEEL BARS
Chicago Hts.(3,4) C2 ... 4.75
Chicago Hts.(3,4), I-2 ... 4.75
Franklin,Pa.(3,4) F5 ... 4.75
FortWorth,Tex.(3,4) T1 ... 4.75
Huntington,W.Va.(3) W7 ... 4.75
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 4.65
Tonawanda(3,4) B12 ... 5.00
Williamsport(3) S19 ... 5.25
William port(4) S19 ... 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(8 R.) B14 ... 9.60
Economy,Pa.(6 R.) B14 ... 11.90
Economy(Staybolt) B14 ... 12.20
MeK.Rks.(Staybolt) L5 ... 11.50
MeK.Rks.(8 R.) L5 ... 9.60
MeK.Rks.(6 R.) L5 ... 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(8) A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.175
Detroit M1 ... 4.40
Ecorse,Mich. G5 ... 3.975
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.825
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.875
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 3.825
Pittsburg,Calif. C11 ... 4.475
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.775
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. R1 ... 5.825
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.575

SHEETS, H.R. (14 ga. heavier) High Strength Low-Alloy
Cleveland J5, R2 ... 5.675
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.275
Gary,Ind. U5 ... 5.675
Ind.Harbor,Ind. I-2 ... 5.675
Ind.Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(35) B2 ... 5.675
Munhall,Pa. U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(26), B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled High Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.475
Fontana,Calif. K1 ... 7.875
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
Irvin,Pa. U5 ... 6.925
Lackawanna(37) B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(28), B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland,O., R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	4.575
Fontana,Calif. K1	4.675
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	4.575
Ind.Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	4.525
Pittsburgh,Pa. J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	4.45
Youngstown,Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Dearborn,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.975
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10, High Strength Low-Alloy

Irvin,Pa. U5	7.025
SparrowsPoint(30) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.425
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1	5.34

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind.Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No. 16 Pure Iron

Ashland,Ky. A10		6.125
Fairfield,Ala. T2		6.125
MartinsFerry,O. W10		6.125

SHEETS, Culvert, No. 16 Alloy

Ashland,Ky. A10	5.875	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor,I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy. O W10	5.875	
Pittsburg,Cal C11	6.625	
SparrowsPt. B2	5.875	
Torrance,Cal C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind.Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TIN PLATE, American 1.25 Coke (Base Box)

	1.50 lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W10 (cut lengths)	....	....	7.85	9.10	9.90
Brackenridge,Pa. A4	....	....	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	....	....	8.55	9.80	....
IndianaHarbor,Ind. I-2	7.55	7.85	(31)	(41)	....
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	....	....
Vandergrift,Pa. U5	....	....	7.85	8.35	9.60 10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	....	....	7.85	8.35	9.60 10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length ½c lower)

Transformer Grade	72	65	58	52
BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.50
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind.Harb.,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	7.85
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Aliquippa,Pa.(25) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta, A11	4.225
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10)S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.10
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.175
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind.Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawanna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A1	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15	6.65
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.,Conn.(10) S15	6.65
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeport,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
Franklin,Park,Ill.(40) T6	5.35
Ind.Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.80
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			8.50	10.50	
Carnegie,Pa. S18		7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit D2	6.45	7.50	8.10		
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
Franklin Park,Ill. T6	6.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E2	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.20	7.60	8.20		
New York W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8 Cleve.orPitts.Base		7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (25)	....	....	10.30	12.50 15.35
Harrison,N.J. C18	....	....	10.30	12.50 15.35
New York W3	....	....	10.30*	12.50* 15.35*
Youngstown C8	....	....	10.30	12.50 15.35

* Plus 1.575 per 100 lb.

STRIP, Hot-Rolled Alloy

NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E2	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40) T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8,(40)	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10)S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.Conn.(10)S15	12.15
Pawtucket,R.I.(11), N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.50
Sharon,Pa. S3	4.50
Youngstown U5	4.15

Key to Producers

A1	Acme Steel Co.	C10	Colorado Fuel & Iron
A3	Alan Wood Steel Co.	C11	Columbia Geneva Steel
A4	Allegheny Ludlum Steel	C12	Columbia Steel & Shaft
A7	American Steel & Wire	C13	Columbia Tool Steel Co.
A8	Anchor Drawn Steel Co.	C14	Compressed Steel Shaft
A9	Angell Nail & Chaplet	C16	Continental Steel Corp.
A10	Armco Steel Corp.	C17	Copperweld Steel Co.
A11	Atlantic Steel Co.	C18	Crucible Steel Co.
A13	American Cladmetals Co.	C19	Cumberland Steel Co.
B1	Babcock & Wilcox Co.	C20	Cuyahoga Steel & Wire
B2	Bethlehem Steel Co.	C22	Claymont Steel Products Dept., Wickwire Spencer Steel Division
B3	Beth. Pac. Coast Steel	D2	Detroit Steel Corp.
B4	Blair Strip Steel Co.	D3	Detroit Tube & Steel
B5	Bliss & Laughlin, Inc.	D4	Disston & Sons, Henry
B6	Bourne Steel Corp.	D6	Driver Harris Co.
B8	Braeburn Alloy Steel	D7	Dickson Weatherproof Nail Co.
B11	Buffalo Bolt Co.	E1	Eastern Gas&Fuel Assoc.
B12	Buffalo Steel Div., H. K. Porter Co.	E2	Eastern Stainless Steel
B14	A. M. Byers Co.	E4	Electro Metallurgical Co.
C1	Calstrip Steel Corp.	E5	Elliott Bros. Steel Co.
C2	Cammel Steel Div. Borg-Warner Corp.	E6	Empire Steel Corp.
C4	Carpenter Steel Co.	F2	Firth Sterling, Inc.
C6	Central Iron & Steel Div. Barium Steel Corp.	F3	Fitzsimons Steel Co.
C7	Cleve. Cold Rolling Mills	F4	Follansbee Steel Corp.
C8	Cold Metal Products Co.	F5	Franklin Steel Div. Borg-Warner Corp.
C9	Colonial Steel Co.	F6	Fretz-Moon Tube Co.
		F7	Ft. Howard Steel & Wire
		G2	Globe Iron Co.
		G3	Globe Steel Tubes Co.
		G4	Granite City Steel Co.
		G5	Great Lakes Steel Corp.
		G6	Greer Steel Co.
		H1	Hanna Furnace Corp.
		I-1	Ingo Bros. Inc.
		I-2	Inland Steel Co.
		I-3	Interlake Iron Corp.
		I-4	Ingersoll Steel Div. Borg Warner Corp.
		I-7	Indiana Steel & Wire Co.
		J1	Jackson Iron & Steel Co.
		J3	Jessop Steel Co.
		J4	Johnson Steel & Wire Co.
		J5	Jones & Laughlin Steel
		J6	Josyn Mfg. & Supply
		J7	Judson Steel Corp.
		J8	Jersey Shore Steel Co.
		K1	Kaiser Steel Corp.
		K2	Keokuk Electro Metals
		K3	Keystone Drawn Steel
		K4	Keystone Steel & Wire
		L1	Laclede Steel Co.
		L2	LaSalle Steel Co.
		L3	Lafayette Steel Co.
		L5	Lockhart Iron & Steel
		L6	Lone Star Steel Co.
		L7	Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.525‡
Atlanta A11	6.325	6.575
Bartonville(19)K4	6.075	6.40
Buffalo W12	5.225	—
Cleveland A7	6.075	6.225
CrawfordsvilleMS	6.175	6.475
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.475	6.80
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	7.00
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	—
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	—
Pitts.,Calif. C11	7.025	7.175
PrtsmthO(18)P12	6.475	—
Rankin A7	6.075	6.225
So Chicago R2	6.075	6.325
So S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1)N15	6.075	6.375
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	—
Worcester A7	6.375	6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5 zinc.

(16 gage)	Stone	Anl'd. Galv. Stone
(Add 4.7% on base and extras)		
Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.73	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325‡
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Sterling(1) N15	10.73†	12.15†
Waukegan A7	10.25	11.55
Worcester A7	—	11.85

*Based on 14c zinc; †14.50c zinc. ‡Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (2)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonowanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	6.175
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfordsville,Ind.MS(48)	5.70
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6(43)	6.20
Massillon,O. R5 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtk't,R.I. (2) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1 (43)	8.75
Bartonville,Ill. K4	8.90
Buffalo W12 (43)	8.50
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.50
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.50
Roebling,N.J. R5 (43)	8.80
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester,Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.2c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1 (43)	6.55
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12(43)	6.55
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Col. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.575

WIRE, Fine & Weaving (8 Coils)

Alton,Ill. L1 (43)	9.20
Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawf'sville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala. 17-18ga.R2	222
Aliqu'pa,Pa.9-14½ga.J5	139‡
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	138
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	145
Johnstown,Pa. B2	138
Johnstown 17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	149
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	136
Sterling,Ill. (1) N15	136

*Based on 14c zinc; ‡17.5c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. P5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	138
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. R12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	146
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	147
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	154
Johnstown,Pa. B2	145
Joliet,Ill. A7	142
KansasCity,Mo. S5	158
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	147
Sterling,Ill.(1) N15	145

*Based on 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	152
Atlanta A11	155
Bartonville,Ill.(19) K4	152
Crawfordsville,Ind. MS	152
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	144
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	152
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	154
Sterling,Ill.(1) N15	152

TRACK BOLTS (20) Treated

KansasCity,Mo. S5(46)	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	127
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
Youngstown H2	128

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.775	3.675	3.725	
Huntington,W.Va. W7				5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	
Johnstown,Pa. B2				(16)4.25
Lackawanna,N.Y. B2	3.775	3.675		4.25
Minnequa,Colo. C10	$25.50*	$23.50*		4.75
Steelton,Pa. B2	3.775	3.675		
Williamsport,Pa. S19				5.00

* Per net ton

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown H2	6.65

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Multrup Steel Products
M13 Monarch Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S2 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Werton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 WickwireSpencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.550
Hi-Carbon-Cr	0.635

Grade by Analyses

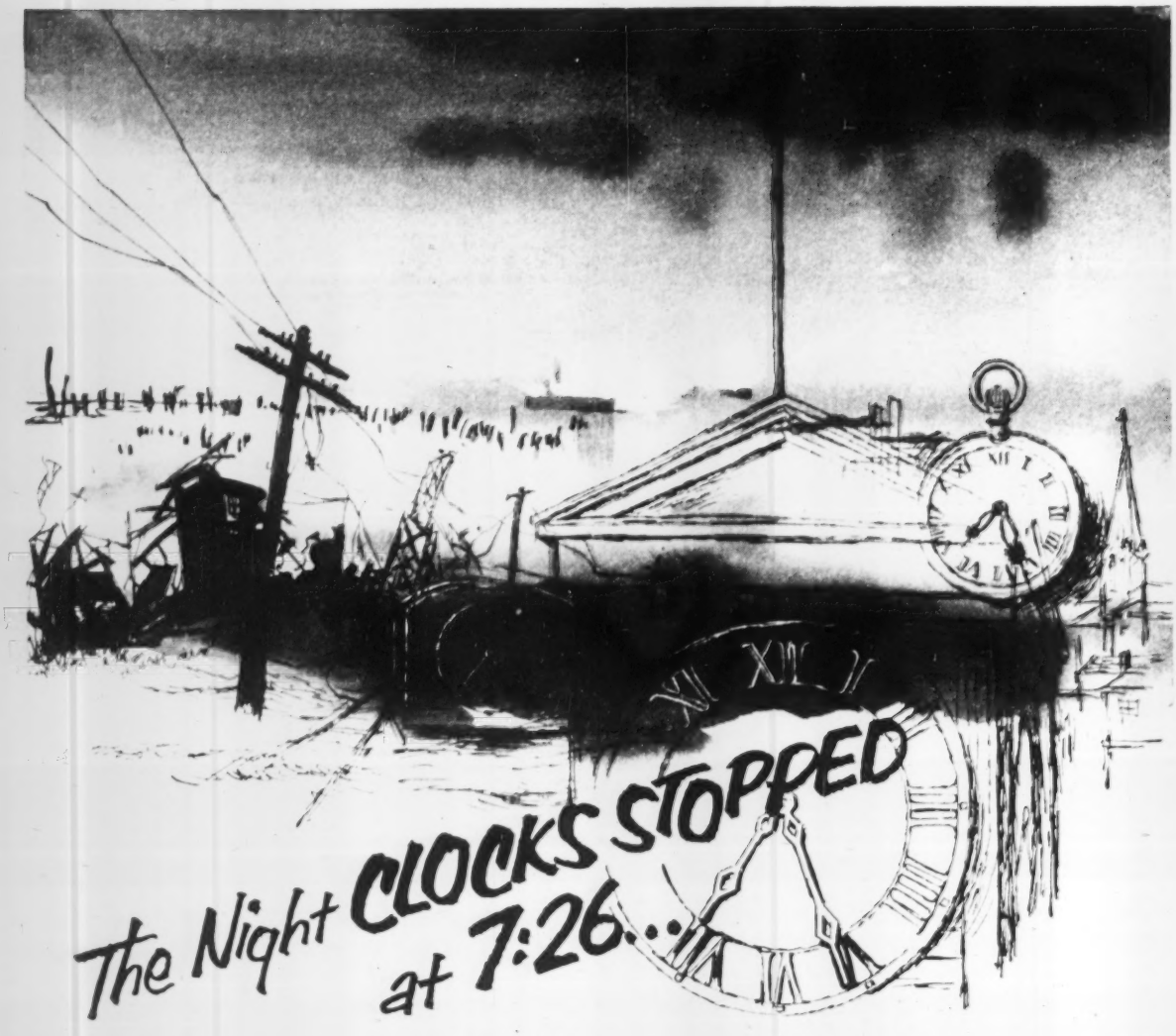
W	Cr	V	Co	Mo		
18	4	1			1.505	
18	4	2		1	65-1.66	
20	2.5	4	25	1.6	12	2.35
18	4	2	7		2.460	
18	2.5	4	25	1	4.75	2.125
18	4	2	9		2.445	2.45
13.5	4	3			1.60	2.1
9	3.25	0.6			1.01	

W	Cr	V	Mo		
6.4	4.5	1.9	5	0.96	0.965
6	4	3	6	1.190	
1.5	4	1	8.5	0.810	

Tool steel producers include A4, A8, B2, B8, C4, C6, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. Base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.2c off for untreated.
(21) New Haven Conn. base.
(22) Incl. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Indust. 0.20c, finer than 6 Ga.
(25) Bar mill basis.
(26) Reinforcing, mill lengths, to fabricators; to consumers, one.
(27) Bar mill basis.
(28) Reinforced.
(29) Add $1.50 per ton.
(30) Shipped, add 0.05c for universal mill.
(31) Not annealed.
(32) 80# or square edge.
(33) To jobbers, deduct 20c.
(34) 25c for cut lengths.
(35) ⅜" and narrower.
(36) ¼" and narrower.
(37) 15 gage & lighter 60" & narrower.
(38) 14 gage & lighter 60" & narrower.
(39) ¼" and narrower.
(40) Lighter than 0.035", 0.05" and heavier.
(41) 0.10c for 5c cut lengths.
(42) Plus 0.05c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cent.
(48) Reinforcing, mill



Some 9,000 people were in South Amboy, N. J., that drizzly evening in 1960. At the waterfront, longshoremen were transferring the last of 12 freight cars of ammunition to lighters that would carry it to a waiting vessel in Raritan Bay.

But the City Hall clock never got to 7:27—and the freighter's deadly cargo never got loaded. Explosions shattered windows over a radius of 12 miles; and hundreds of people looked at their arms and legs and saw that flying daggers of glass had stabbed them.

At dawn, 312 of the injured had been counted.

* * *

Such disasters have happened many times before in America. They could happen again. And *if* they do—and *when* they do—there must be blood plasma on hand to take care of the injured. For blood saves lives!

But blood cannot be mined or manufactured. It must come from the veins of healthy men and women. Men and women who feel concern for a suffering neighbor. So give blood—now!

Whether your blood goes for Civil Defense needs, to a combat area, or to a local hospital—this priceless, painless gift will some day save an American life!

A PUBLIC SERVICE PROJECT OF THE ADVERTISING COUNCIL

Give Blood Now

CALL YOUR RED CROSS TODAY!

National Blood Program

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	5.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft.	0.53		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	13.25	33.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. L1 (‡)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	14.25	33.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (‡)	32.5	13.25	33.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (‡)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75						
Ind. Harbor, Ind. Y1 (‡)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (*‡)	32.5	22.25	33.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25						
Sharon, Pa. M6	32.5	14.25	33.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown B2 (**‡)	32.5	16.25	33.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
Youngstown Y1 (‡)	32.5	15.25	33.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	33.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*‡)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, B2 (**‡)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1	
List Per Ft.	5.5c		6c		6c		9.2c		$1.09			
Pounds Per Ft.	0.24		0.42		0.57		0.20		10.89			
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv		
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25		
Butler, Pa. P6 (‡)	30.5	1.25	25	+1.75	20	+5.5						
Etna, Pa. N2 (‡)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25		
Sharon, Pa. M6 (‡)	29.5	1.75	23	+2.25	18	+5.25						
Sharon, Pa. S4 (‡)	30.5	1.25	25	+1.75	20	+5.5						
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50						
Youngstown B2 (**)							33	15.75	33	15.75		
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50						

Galvanized pipe discounts based on zinc price of 13½c, 14c, 15½c, 12.50c, (**), 11.50c, (*), 9c, with discounts adjusted depending on price of zinc at time of shipment.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding	Plates		Sheets		
	Carbon Base		Carbon Base		Copper Base
Stainless	10%	20%	10%	20%	Both Sides
302			19.75	26.24-27.50	77.00
304	25.00	26.50	24.50	27.50-27.77	77.00
309	30.50	35.00			
310	36.50	41.00			144.00
316	29.50	34.00	26.00	35.92-36.50	
317	34.50	39.00			
318	33.50	38.00			
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75			
410	20.75	27.25			
Nickel	33.50	45.15			
Inconel	41.25	54.18			165.00
Monel	34.93	46.28			
Copper*				44.00	

	Strip			
	Carbon Base			
	Cold Rolled		Hot Rolled	
	10%	Both Sides	10%	Both Sides
Nickel	41.00	54.00		
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheets, Coatesville, Pa. A3 and New Castle, Ind. I4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J5; nickel, Inconel, monelclad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A11.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

⅜-in. & smaller diam. 6 in. and shorter	15
⅜-in. & smaller diam. longer than 6 in.	18.5
½-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.	
All diams.	14
Lag bolts, all diams., 6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Puller & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Sq.	Reg. Hvy.
⅜-in. & smaller	15
½-in. & ⅝-in.	12
¾-in. to 1-in.	6.5
1⅛-in. & larger	7.5
H.P. Hex.	
⅜-in. & smaller	26
½-in. & ⅝-in.	16.5
¾-in. to 1-in.	12
1⅛-in. & larger	18.5

⅜-in. & smaller	22
½-in. & ⅝-in.	12
¾-in. to 1-in.	6.5
1⅛-in. & larger	12

SEMIFINISHED NUTS

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
⅜-in. & smaller	35	25.5
½-in. & ⅝-in.	29.5	22
¾-in. to 1-in.	24	15
1⅛-in. & larger	13	8.5

⅜-in. & smaller	Light 35
½-in. to ⅝-in.	29.5
¾-in. to 1-in.	26

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1-in. diam. x 6 in. and shorter	38
1-in. and smaller diam. x over 6 in.	26

COAL, CHEMICALS

Spot, cents per gallon, ovens unless otherwise noted.

Pure, benzol: 36.00

Toluol, one deg.: 30.00-33.00

Industrial xylol: 30.00-33.00

Per ton, bulk, ovens

sulphate of ammonia $44 f.o. Birmingham area, $40 f.o.b.

Cents per pound, ovens

Phenol, 90 carlots, non-returnable drums: 17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported net ton duty paid metallurgical grade $30-$35.

METALLURGICAL COKE

Price per ton

BEEHIVE OVENS

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.50
New River foundry	20.50
Wise county, foundry	15.50
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	28.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
ConeStar, Tex., ovens	18.50
Philadelphia, ovens	23.75
Swedeland, Pa., ovens	23.75
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.05
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.50 freight zone from works.

NOTE: Current prices on boiler tubes, electrodes and rivets appeared on page 156 issue 2

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C R Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
305	56.00	50.00	44.25
316	57.00	50.00	49.25
321	49.25	48.25	42.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00*	15.25

Bar: Types 301-347 and 430 sheets except 301 and 309: F2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 31.00c on Type 301, 36.00c 302, 38.50c, 304, 50.50c, 316, 52.00c, 347, 50.50c, 410, 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C15.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.00c; Type 316, 51.00c, including 4.7% increase on base price.

Massillon, O., all items B2.

McKeesport, Pa., strip, Type 416, bars & wire, Types 430 through 430 and 31.25c on Type 302, 33.75c on 304, 32.25c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire 17 quotes Types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309, bars except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 F1.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh except as otherwise noted)

Sponge iron	Cents
99.5% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l. in bags	10.90
Electrolytic iron	
Annealed, 99.5% Fe	42.50
Unannealed 99+% Fe	36.50
Unannealed 99+% Fe, minus 325 mesh	53.50
Powder Flakes	48.50
Carbonyl iron	
97.9-99.8% size 5 to 10 microns	$3.00-18.00
Aluminum	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	31.00-34.25
Bronze, 10-ton lots	51.25-60.00
Phosphor Copper, 20-ton lots	50.00
Copper	
Electrolytic	37.25
Reduced	35.25
Lead	7.50*
Magnesium	75.00-85.00
Manganese	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel Silver, 5-ton lots	46.00
Silicon	38.50
Solder	8.50*
Stainless steel, 302	83.00
Zinc, 10-ton lots	31.00
Tungsten	Dollars
Melting grade, 99% on 35 to 200 mesh, 1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum, 99% minus 200 mesh	3.24
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal

"... More than 50% of our employees are on the Payroll Savings Plan..."

PAUL W. JOHNSTON
President, Erie Railroad

"We on the Erie Railroad are extremely proud that 50% of our employees are on the Payroll Savings Plan for U.S. Defense Bonds. These thousands of employees are regularly providing for their own future security and at the same time contributing to the strength of our national defense. The American habit of thrift and regular purchase of U.S. Defense Bonds Shares in America are evidences of good, sound citizenship."

Good, sound citizen-ship . . . the American habit of thrift . . . a belief that a strong America is a secure America . . . a management that makes the Payroll Savings Plan available to *all* its employees—these are the reasons why more than 50% of Erie Railroad employees are enrolled in the Payroll Savings Plan.

For the same four reasons, more than 7,500,000 employed men and women in thousands of other companies are active members of the Payroll Savings Plan—their take-home savings in the form of U.S. Defense Bonds total more than $150,000,000 per month.

Is your company in the "more than 50% participation" group? If it isn't, please bring this page to the attention of your top executive. Point out to him—

Two Simple Steps to a Successful Payroll Savings Plan

1. Phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C.
2. Your State Director, Savings Bond Division, will show your company how to conduct a simple person-to-person canvass that will put a Payroll Savings Application Blank in the hands of *every* employee.

That is all management has to do. Your employees will do the rest. They, like the employees of the Erie Railroad, want to provide for their personal security and at the same time do their part in helping to keep America strong.

The United States Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

STEEL
The Weekly Magazine of Metalworking

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents, Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††	Standard Structural Shapes	Carbon	Floor
Baltimore	5.81	7.17	8.32	6.42	...	6.41	7.18	11.17	6.47	6.47	7.70
Boston	6.51	7.36	8.49	6.55	...	6.42	7.47	11.18	6.56	6.75	7.98
Buffalo	5.80	6.65	8.41	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70	5.80	...	5.80	8.65	...	5.95	6.10	8.65
Chicago	5.80	6.65	7.95	5.83	...	5.83	6.56	10.65	5.95	5.95	7.18
Cincinnati	6.08	6.67	8.21	6.09	...	6.08	7.11	11.02	6.37	6.42	7.56
Cleveland	5.80	6.65	8.05	6.00	...	5.86	6.66	10.76	6.28	6.42	7.51
Detroit	6.21	6.46	8.44	6.08	7.405	6.42	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.67	6.80	...	6.98	...	...	6.82	6.78	8.16
Jersey City, N.J.	6.35	7.27	8.47	6.75	...	6.59	7.78	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.55	6.75	11.20	6.60	8.35	12.05	6.60	6.65	8.90
Milwaukee	5.97	6.82	8.12	6.00	...	6.00	6.83	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.30	6.16	...	6.18	6.91	...	6.30	6.30	...
Newark, N. J.	6.62	7.41	8.58	6.72	...	6.70	7.46	...	6.70	6.78	7.98
New York	6.36	7.37	8.47	6.56	...	6.68	7.64	11.14	6.49	6.70	8.11
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.16	7.18	8.30	6.50	8.30	6.47	7.50	10.84	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.95	5.94	...	5.83	6.66	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.65	9.75	7.60	...	7.35	9.40	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.62	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.25	6.14	...	6.13	6.96	10.95	6.35	6.40	7.58
St. Paul	6.47	7.31	8.61	6.50	...	6.40	7.32	...	6.61	6.61	7.84
San Francisco	6.85	8.35	9.45	6.70	...	6.60	8.40	12.00	6.45	6.70	8.85
Seattle-Tacoma	7.16	8.24	9.50	7.45	...	6.88	9.37	11.90§	6.63	7.04	8.90
Spokane (city)	7.50	9.40	10.06	7.65	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.96	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded); and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; *—500 to 1499 lb; **—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-$1.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-$42.00
48% 3:1	41.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Domestic (Rail nearest seller)	
48% 3:1	$30.00

Molybdenum

Sulphide concentrates, per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High Heat Duty: Pueblo, Colo., $86.00; Ashland, Grafton, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $96.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2600° F.: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Fire Clay: Bessemer, Ala., $61.60; Silver Hill, Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $205.40; Clearfield, Pa., $210.45; St. Louis, $221.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $155.20; Johnstown, Pa., $161.70; Clearfield, Pa., $166.60; St. Louis, $170.30; Athens, Tex., $174.40.

High Alumina Brick

56 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., $166.30; Danville, Ill., $164.30.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

CALCIUM ALLOYS

Calcium Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%.) Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.5c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%.) Contract, carload, lump, bulk 10.6c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.) Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.7c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 7-12%, C 0.50% max.) Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. 1 lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size, weighing approx. 3 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size, weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic Oxide Briquets: (Containing 2% lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 161, Mar. 2 issue; manganese and titanium alloys and "other" ferroalloys, page 147, Feb. 16.

IRON AND STEEL SCRAP

Open market prices as reported to STEEL Mar. 5, 1963, gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 5	$45.00
Feb. 26	43.00
Feb. 1953	43.00
Mar., 1952	42.00
Mar., 1948	40.21

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Including brokers' commissions)

No. 1 heavy melting	44.00*
No. 2 heavy melting	44.00*
No. 1 bundles	42.00*
No. 2 bundles	42.00*
No. 1 busheling	44.00*
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	36.00-37.00*
Short shovel turnings	36.00-37.00*
Cast iron borings	38.00-39.00*
Cut structurals	48.00-51.00*
Heavy turnings	44.00*
Punchings & plate scrap	47.50*
Electric furnace bundles	46.00*

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-49.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00-44.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00
Rails, 2 ft. and under	53.00
Rails, 18 in. and under	55.00
Rails, random length	49.00

*Plus applicable freight equalization from other areas

CLEVELAND

(Delivered consumers' plants, including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	44.00-44.50*
No. 1 bundles	44.00-44.50*
No. 2 bundles	44.00-44.50*
No. 1 busheling	44.00-44.50*
Machine shop turnings	31.00-32.00*
Mixed borings, turnings	35.00-36.00*
Short shovel turnings	35.00-36.00*
Cast iron borings	35.00-36.00*
Low phos.	48.00-50.00*
Alloy free short shovel turnings	37.00-38.00
Electric furnace bundles	46.00-46.50*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	38.00-38.50
Brake shoes	41.00
Clean auto cast	52.00
No. 1 Wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
R.R. Malleable	50.00-51.00
Rails, 2 ft. and under	51.00-52.00
Rails, 18 in. and under	51.00-52.00
Rails, random lengths	49.00-50.00
Cast steel	51.00-52.00
Railroad specialties	51.00-52.00
Uncut tires	51.00-52.00
Angles, splice bars	51.00-52.00
Rails, rerolling	51.00-54.00

*Plus applicable freight equalization from other areas

YOUNGSTOWN

(Delivered consumers' plant, including broker's commission)

No. 1 heavy melting	43.00-43.50*
No. 2 heavy melting	44.00-44.50*
No. 1 bundles	43.00-43.50*
No. 2 bundles	44.00-44.50*
Machine shop turnings	32.00-33.00*
Short shovel turnings	36.00-37.00*
Cast iron borings	36.00-37.00*
Low phos.	50.00-51.00*
Electric furnace bundles	47.00-47.50*

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00

*Plus applicable freight equalization from other districts

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	$40.00
No. 2 heavy melting	35.00
Machine shop turnings	25.00
Mixed borings, turnings	29.00

Cast Iron Grades

No. 1 cupola	40.00
Unstripped motor blocks	32.00-33.00

PHILADELPHIA

(Delivered consumer plants)

No. 1 heavy melting	45.00
No. 2 heavy melting	43.00-43.50
No. 1 bundles	45.00
No. 2 bundles	nominal
No. 1 busheling	44.50
Machine shop turnings	33.50-34.00
Mixed boring, turnings	37.00-38.00
Short shovel turnings	37.00-38.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	45.00
Heavy breakable cast	47.50-48.00
Unstripped motor blocks	39.00
Drop broken machinery	50.00

Including 50c piece differential

CINCINNATI

No. 1 heavy melting	42.00
No. 2 heavy melting	42.00
No. 1 bundles	43.00
No. 2 bundles	42.00
No. 1 busheling	43.00
Machine shop turnings	33.00
Mixed borings, turnings	37.00
Short shovel turnings	37.00
Cast iron borings	37.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	48.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00
Brake shoes	41.00
Clean auto cast	52.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	45.00
Malleable	55.00
Rails, 18 in. and under	53.00
Rails, random lengths	47.00
Rails, rerolling	52.00

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	40.00-41.00
No. 2 bundles	38.00-39.00
No. 1 busheling	40.00-41.00
Machine shop turnings	26.00-27.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Punchings & plate scrap	44.00-46.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	45.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	50.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	$43.00-44.00
No. 2 heavy melting	42.00-43.00
No. 2 bundles	42.00-43.00
No. 1 bundles	43.00-44.00
No. 1 busheling	43.00-44.00
Machine shop turnings	32.50-33.00
Mixed borings, turnings	36.50-37.00
Short shovel turnings	36.50-37.00
Low phos.	48.50-49.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON

(Brokers' Buying Prices f.o.b. shipping points)

No. 1 heavy melting	34.17
No. 2 heavy melting	31.17
No. 1 bundles	33.17
No. 2 bundles	31.17
Machine shop turnings	24.17
Mixed borings, turnings	22.17
Short shovel turnings	28.17

No. 1 cast	35.00-36.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	47.00-49.00

CHICAGO

(Including broker's commission)

No. 1 heavy melting	42.50
No. 2 heavy melting	40.50
No. 1 bundles	43.50
No. 2 bundles	39.00
No. 1 busheling	43.50
Machine shop turnings	29.00-30.00
Mixed borings, turnings	31.50-32.50
Short shovel turnings	31.50-32.50
Cast iron borings	31.50-32.50
Cut structurals	46.50
Heavy turnings	41.50
Electric furnace bundles	45.00

Cast Iron Grades

No. 1 cupola	42.00-44.00
Stove plate	42.00-43.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	48.00-50.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt	45.00-47.00
R.R. Malleable	46.00-48.00
Rails, 2 ft. and under	51.00
Rails, 18 in. and under	53.00
Rails, random lengths	52.00-54.00
Angles, splice bars	50.00
Rails, rerolling	52.00-54.00

BIRMINGHAM

No. 1 heavy melting	38.00
No. 2 heavy melting	38.00
No. 1 bundles	39.00
No. 2 bundles	38.00
No. 2 busheling	38.00
Machine shop turnings	29.00
Mixed borings, turnings	33.00
Short shovel turnings	30.00-32.00
Cast iron borings	30.00-32.00
Cut structurals	42.00
Heavy turnings	38.00
Punchings & plate scrap	41.00
Electric furnace bundles	41.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	44.00-45.00
Charging box cast	39.00-40.00
Stove plate	42.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 Wheels	47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	41.00
Malleable	53.00
Rails, 2 ft. and under	46.00
Rails, 18 in. and under	49.00
Rails, random lengths	46.00-51.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00
Rails, rerolling	48.00

ST. LOUIS

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
Machine shop turnings	28.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	48.00
Rails, 2 ft. and under	53.00-57.00
Rails, random lengths	52.00-54.00
Uncut tires	48.00
Angles, splice bars	48.00
Rails, rerolling	50.00-52.00

SEATTLE

(Delivered consumer point)

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	33.00
No. 2 bundles	27.00
Machine shop turnings	25.00
Mixed borings, turnings	25.00
Short shovel turnings	25.00
Electric furnace, No. 1	40.41

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00

Railroad Scrap

Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 Wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00
Malleable	55.00
Rails, 2 ft. and under	42.00
Rails, 18 in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	44.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	28.00
Busheling new factory	
Prepd.	33.00
Unprepd.	31.00
Short Steel Turnings	28.00

Cast Iron Grades?

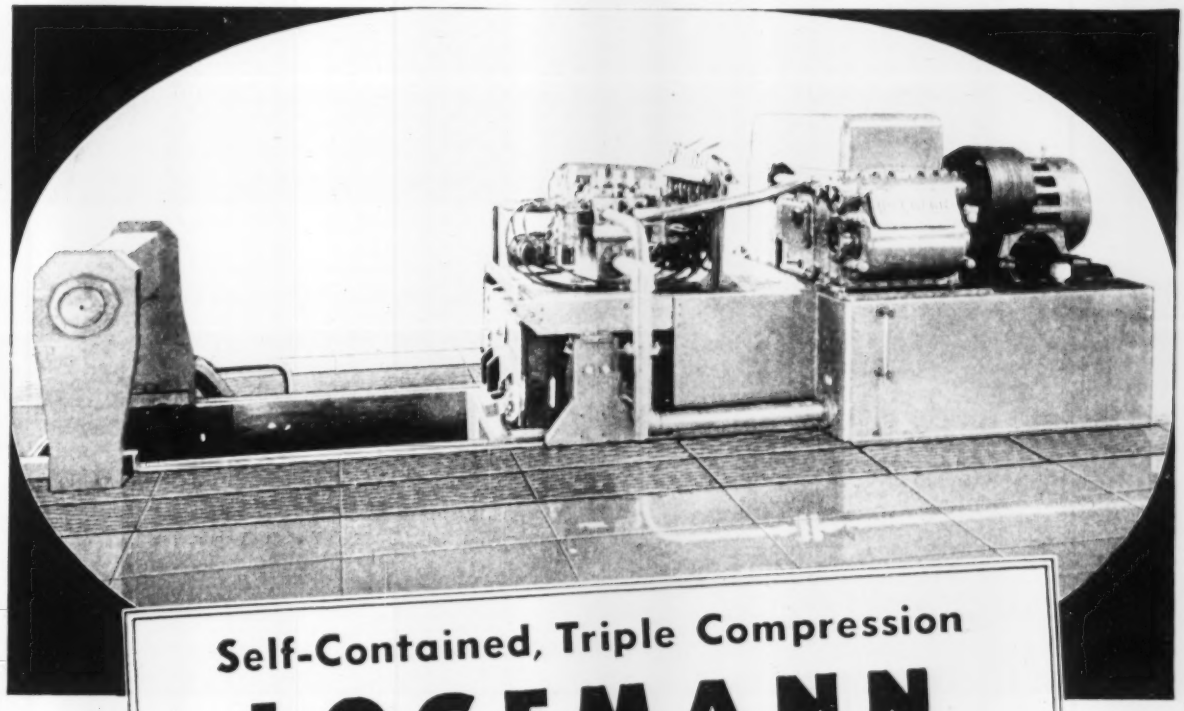
No. 1 Machinery Cast	50.00

F.o.b. shipping point

OLD CEILING BASE PRICES

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling or the ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.50	43.50
Duluth, Minn.	40.00	42.00



Self-Contained, Triple Compression

LOGEMANN SCRAP PRESSES

...give you compact, high density bales . . . at low cost!

LOGEMANN

Also specializes in

WASTE PAPER BALERS

for Industrial Applications

and in

HIGH PRESSURE PUMPS

. . . for pressures from 2000 to 50,000 p.s.i. for press operation, hydrostatic tests, and similar applications.

You Conserve Floor Space and Piping with this Compact Installation

Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

Also available are various sizes and types of pumps and operating valves to meet output requirements. Logemann Scrap Presses can be equipped with loading hopper in which the scrap charge can be prepared while the press is going through the operations on the preceding bale. Compressed bales are delivered at floor level for ejection to conveyor, steel chute, or into accumulation pit.

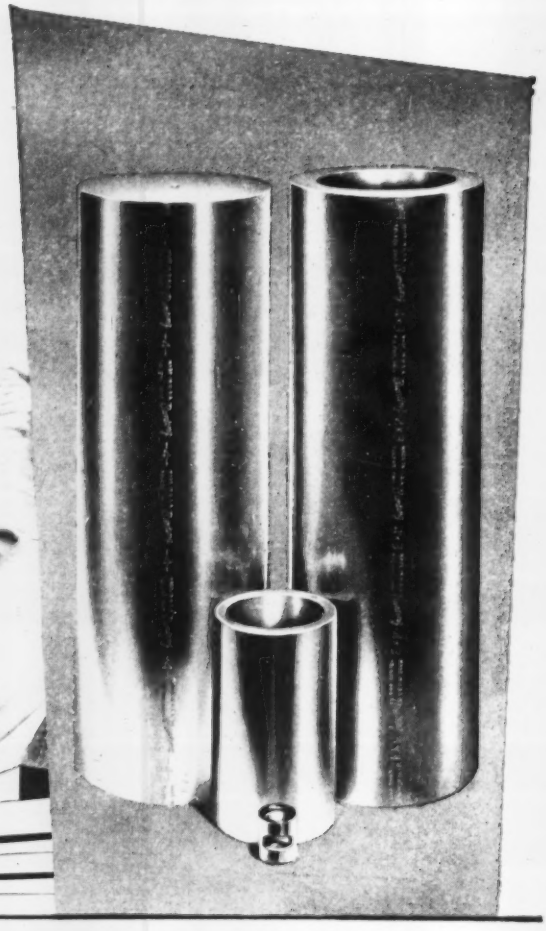
Write for Complete Details

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

They

KEEP PLANTS RUNNING!



Bunting Precision Bronze Bars

Protection against shut-downs is constantly provided, right in your own community, by your Bunting Distributor and Bunting Precision Bronze Bars. Factory machined on all surfaces, Bunting Bronze Bars save you 25% of purchased metal, 50% of machining time and wear on costly tools.

The Bunting Distributor

Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, bronze or Bearings, bronze. If he is the leading distributor, he almost certainly is the Bunting Distributor. He carries in stock, for your money saving convenience, completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes meeting all your usual production and maintenance needs. Ask him for catalog.

N E W S

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BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

The Metal Market

Order may not return to copper market for 60 days. Don't expect a realistic price level until all allocation controls are off and consumers' pressing demands are met

AT LEAST 60 days will pass before order returns to the copper market.

No realistic price level will come till allocation controls come off and pressing demands from consumers are met. That's trade consensus at the moment, though a surprising number of experts won't even venture a guess on future trends.

Actually copper, copper wire and brass markets have shown remarkable recuperation in the 12 days since price walls were blasted, considering the artificial structure had been built up in over two years of control.

Rambling Rates — Multiplicity of prices under control was bush league compared to the present colossus. Every seller has his own idea of copper price, and until a definite trend is established, he'll sit tight. Present range of copper extends from 27.50 cents to 32 cents for domestic and up to 36.50 cents for foreign metal. Lake copper isn't even quoted. Some sales of domestic metal have been reported at above 32 cents, but they are exceptional cases now.

Lowest domestic quotation was set by Kennecott at 27.50, in an apparent attempt to set a conservative market tone. Phelps Dodge lists 28.50 and Anaconda 32.00. None of Anaconda's domestic copper is sold on the market though; for 30 years its entire U. S. output has gone to its subsidiary American Brass Co. Custom smelters' prices are about standard at 32.00 cents; one company posted 36.00 cents for two days but came back to earth when it saw which way the wind was blowing.

Out in the Cold—Independent fabricators should make friends with copper salesmen if they want domestic metal. Now that the 60-40 breakdown of domestic-foreign authorizations is defunct, domestic producers will certainly take care of their fabricating affiliates first. Independents may be forced to get all their supplies from abroad.

Another complication is the current practice of pricing copper at date of delivery, making it tough for manufacturers to quote firm selling prices in trying to land new orders. Some brokers are making capital of this situation by offering fixed prices on nearby and forward shipments. Dealers' price is 33.75 for April and 32.50 for May-June deliveries.

Follow the Leader—Brass mills and copper wire mills all have new and higher price lists. Anaconda Wire & Cable Co. and American Brass Co. base quotations on an average copper price of 33.80 cents. Kennecott Wire & Cable Co. and Chase Brass & Copper Co. calculate on an average of 31.10 cents. Phelps Dodge Copper Products Corp. bases price increases on an average price of 32.10 cents.

Such large independent brass mills as Bridgeport Brass Co., Revere Copper & Brass Inc. and Scovill Mfg. Co. followed the price trend set by Chase. Full listings of new prices on copper and brass rolled, drawn and extruded products can be found on the following page.

STEEL'S Metal Price Averages for Feb., 1953

(Cents per pound)

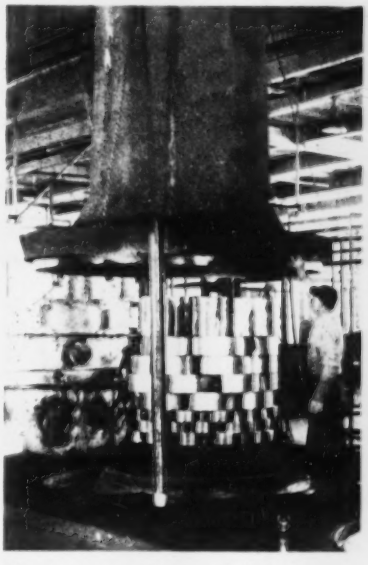
Electrolytic Copper, del. Conn.	25.14
Lead, St. Louis	13.30
Prime Western Zinc, E. St. Louis	11.43
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	20.50
Antimony, f.o.b. Laredo, Tex.	34.50
Nickel, f.o.b. refinery	60.00
Silver, New York	85.25

Free Trading Nears in Copper

Return of free trading in copper on the London Metal Exchange isn't far off. The U. K. must give Rhodesian producers 6-months' notice of termination of buying agreement before it's done though. Several thousand tons of Rhodesian copper have been diverted to the U. S. to take advantage of the price differential. The British Ministry of Materials holds large tonnage of copper estimated at close to 150,000 tons.

Zinc Tumbles Again

The price of zinc has declined a quarter of a cent per pound to 11 cents in E. St. Louis. And prime western demand is soft, but automotive activity sustains special high grade at a good level. Foreign zinc still undersells domestic metal by a half-cent or more, and there's plenty of zinc from overseas to dispose of. Imports last year of 501,067 tons topped 1951 by 152,646 tons and the year was close to record 1943.



Furnaces Anneal Brass

When close control of physical properties is essential, special lots of brass that have been slit to narrow widths are annealed in these bell-shaped furnaces in the Chase Brass & Copper Co. plant at Waterbury, Conn.

Lithium Supply To Rise

More commercial compounds of lithium, lightest known metal, will be available to industry. Foote Mineral Co. is constructing at Sunbright, Va., the world's largest lithium plant, designed to process 1500 tons monthly of spodumene, a silicate of lithium and aluminum. Ore output from the company's mines at Kings Mountain, N. C., will be tripled. Chief user of the lithium compounds is the ceramics industry.

Nonferrous Briefs

Because lead from abroad undersold U. S. metal by more than half a cent, producers were forced to drop prices by 0.50-cent to 12.80, St. Louis and 13.00, New York. They had hoped to hold the price line until spring when battery makers enter the market in force. Last week's move was the year's fourth drop.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 27.50-32.00. Conn. Valley, Lake ports, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.50-88.50 (No. 215) 41.75; 80-10-10 (No. 305) 35.00; No. 1 yellow (No. 405) 24.00.

Zinc: Prime western 11.00; brass special 11.25; intermediate 11.50; East St. Louis high grade 12.50; and special high grade 12.50; delivered.

Lead: Common 12.95; chemical 12.90; corroding 12.90; St. Louis.

Primary Aluminum: 99% plus, ingots 20.50; pigs 19.50. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb carlots.

Secondary Aluminum: Piston alloys 22.00-23.50; No. 12 foundry alloy (No. 2 grade) 22.25-22.75; steel deoxidizing grade, notch bars granulated or shot: Grade 1 23.00-24.00; grade 2, 22.50-23.00; grade 3, 21.25-22.25; grade 4, 21.00-22.00.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50.

Antimony: American 99.90-8% and over but not meeting specifications below 24.50; 99.8% and over, arsenic 0.06% max., other impurities 0.1% max., 25.00; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9% base sizes at refinery, unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot, 63.65; "F" nickel shot or ingots, for addition to cast iron, 60.00. Prices include import duty.

Mercury: Open market, spot, New York, $200-$201 per 76-lb flask.

Beryllium Copper: 3.75-4.50% Be, $37.72 per lb of contained beryllium, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs), $2.42 per lb for 100 lb (cases), $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.2c per oz.

Platinum: $90-$94 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Feb. 27, 1953. Listings are lowest quotations.)

Sheet: Copper 48.93; yellow brass 42.03; commercial bronze, 95% 48.19, 90% 47.46; red brass, 85% 44.91, 80% 44.89; best quality, 13.00; nickel silver, 18% 56.32; phosphor-bronze grade A, 5% 68.37.

Rod: Copper, hot rolled 45.33; cold drawn 46.83; yellow brass free cutting 35.92; commercial bronze, 95% 48.19, 90% 47.15; red brass, 85% 45.60, 80% 44.58.

Seamless Tubing: Copper 48.92; yellow brass 44.94; commercial bronze, 90% 50.02; red brass, 85% 48.72.

Wire: Yellow brass 42.32; commercial bronze, 95% 48.78, 90% 47.75; red brass, 85% 46.20, 80% 44.48; best quality brass 43.78.

(Base prices, effective Feb. 26, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots 33.24; 30,000 lb lots 33.27; 10,000 lb lots 33.77. Weatherproof 100,000 lb 35.35; 30,000 lb 35.60; 10,000 lb 36.10. Magnet wire del. 1,000 lb or more 41.00; 1c-l, 41.85.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Width or Diameters, In.	Flat Sheet Base*	Coiled Sheet Base	Circles Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.3
0.060-0.048	12-48	35.0	32.2	36.5
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.8	33.0	37.5
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.8
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.6	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.008	12-24	44.3	40.7	48.5
0.007-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	55.2

*Lengths 72 to 180 inches. Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or distance across flats	Round 17S T4	Hexagonal 17S T4
0.125	56.8	...
0.126-0.indiss	48.0	...
0.25-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets: Full rolls, 140 sq ft, or more $18.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.50 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00; f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50; f.o.b. mill 36,000 lb and over. Plates not over 12 in., 20.75-21.75c; over 12 in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Feb. 13, 1953.) Sheets, cold-rolled 83.00c. Strip, cold-rolled 80.00c. Rods and shapes, 79.00c. Plates 81.00c. Seamless tubes 112.00c.

MONEL

(Base prices f.o.b. mill, effective Feb. 13, 1953.) Sheets, cold-rolled 66.50c. Strip, cold-rolled 65.50c. Rods and shapes, 63.50c. Plates 63.50c. Seamless tubes, 96.50c. Shot and blocks, 58.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. to 4 in. diameter, less than 25 lb, 50.00-62.00c; 25-50 lb, 45.00-52.00c; 100 lb to 5,000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 25	27.50-32.00	12.80	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 25-28	27.50-28.50	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 20-24	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.50	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 7-10	24.50	14.30	13.00	121.50	20.00	34.50	56.50	83.25
Feb. 1953 Avg.	25.136	13.350	11.431	121.50	20.50	34.50	60.00	85.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	16.50	121.50	19.00	50.00	56.50	88.00
Feb. 1948 Avg.	21.50	14.825	12.00	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley. Lead, common grade, del. St. Louis. Zinc, prime western, E. St. Louis. Tin, Straits, del. New York. Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50; 1 to 5 tons, 28.00c; less than 1 ton 28.50.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed: Flat, rolled 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50; 3000 to 10,000 lb 76.00c; 500 to 3000 lb 77.50; 100 to 500 lb 79.50c; under 100 lb, 82.50c, f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags, 34.50c in lots of 500 lb through 10,000 lb, 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 500 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.2c, 100 or 350 lb drums only, 100 to 600 lb 71.6c, 700 to 1000 lb 69c, 2000 to 9000 lb 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.44. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c; 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs of 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 100 lb bbl $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 15,000 pounds, f.o.b. shipping point. Listings are lowest quotations.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	27.125	27.125	26.375
Yellow Brass	26.625	26.375	19.500
Commercial Bronze			
95%	25.750	25.500	25.000
90%	24.875	24.625	24.125
Red Brass			
85%	24.000	23.750	23.250
80%	23.000	22.750	22.250
Best Quality (71-80)	21.500	21.250	20.750
Muntz metal	19.375	19.125	18.625
Nickel silver, 10%	24.375	24.125	12.875
Phos. Bronze, A	29.125	28.875	27.875
Naval Brass	19.25	19.00	18.50
Manganese Bronze	19.25	19.00	18.50

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 28.50; No. 2 copper 26.50; light copper 24.00; refinery brass (80%) copper; lead dry copper content 24.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.00 nom.; No. 2 23.00 nom.; light copper 22.00-22.50; No. 1 composition red brass 19.00 nom.; No. 1 composition turnings 18.50 nom.; mixed brass turnings 13.50 nom.; new brass clippings 18.50; No. 1 brass rod turnings 15.00-15.50; light brass 12.50 nom.; heavy yellow brass 14.50 nom.; new brass rod ends 17.50; auto radiators, unsweated 13.00 nom.; cocks and faucets 16.50 nom.; brass pipe 17.50 nom.

Aluminum: Clippings 28; 13.00; old sheets 16.00; crankcase 16.00; borings and turnings 8.00; pistons and struts 6.50.

Tin: No. 1 pewter 76.00; block tin pipe 100.00; No. 1 babbitt 60.00.

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 10.25-10.50; mixed babbitt 13.75-14.00.

Zinc: old zinc, 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00.

Nickel: Sheets and clips 58.00-60.00; rolled anodes 58.00-60.00; turnings 56.00; rod ends 58.00-60.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; pods 33.00.

Steel Bars . . .

Bar Prices, Page 177

New York—Hot carbon bar demand is well sustained, with prospects slim for the placing of much, if any, non-rated work in first half. Bars, ranging 1½ inches and larger, appear definitely out of reach for non-rated consumers over remainder of this period, due primarily to shell requirements. Even the smaller sizes appear in more active demand, reflecting, in part, the needs of the automotive and agricultural equipment industries.

Boston—Only in smaller sizes, cold-rolled, including low-carbon screw stock, are bars slightly more plentiful. Part of this comes from space openings with converters where hot stock is available. Prospects for any substantial unrated tonnage for second quarter are dim.

Philadelphia—Increasing amount of shell work is placing a tighter squeeze on carbon bars.

Pittsburgh—Basis of distribution for hot-rolled bars in third quarter will largely depend upon the outlook at the time of complete decontrol.

Cleveland—Bar mills are booked ful through second quarter and there is nothing in the market to indicate any early easing in supply conditions, especially in the larger sizes.

Sheets, Strip . . .

Sheet and Strip Prices, Page 177-178

Boston—Flat-rolled consumers are fishing around for more open-end sheet tonnage for second quarter with fair prospects of getting part of estimated tonnage filled. Those producers, sparingly taking first quarter commitments, operating on carryovers, may satisfy part of this demand. With exception of galvanized, notably at warehouse level, buying has shifted heavily to carbon sheets, notably cold-rolled.

Philadelphia—Increasing activity is noted in sheets. Automotive requirements are particularly pressing and brisk demand prevails for most household appliances. Broadening use of pressed metal for bathtubs, washers and dryers, especially in heavier gages, 14 to 16, is reflected in an active demand for enameling stock.

New York—Pressure for hot and cold-rolled sheets continues strong. Also electrical sheets and enameling stock are in demand. There appears to be little likelihood of any tonnage being obtained for shipment in first half without CMP tickets.

Pittsburgh—Demand for long ternes and electrical sheets is expected to be strong for the entire second quarter. Warehouse demand is good for most sheet items, except galvanized, which at present seems to be building up, and for hot rolled strip. Hot rolled is reaching a saturation point with warehouses. Inquiries for this material are falling off, and the reason given is the good inventories that most warehouses have built up.

Cleveland—With the approach of spring, producers of galvanized sheets are anticipating a pickup in demand, which over the winter months has lagged noticeably in some areas. Pressure for other grades of sheets is undiminished, with hot and cold-rolled in especially tight supply. Producers are booked into second quar-

For better grinding it's well worth having!

SIMONDS ABRASIVE CO.

Grinding Wheels

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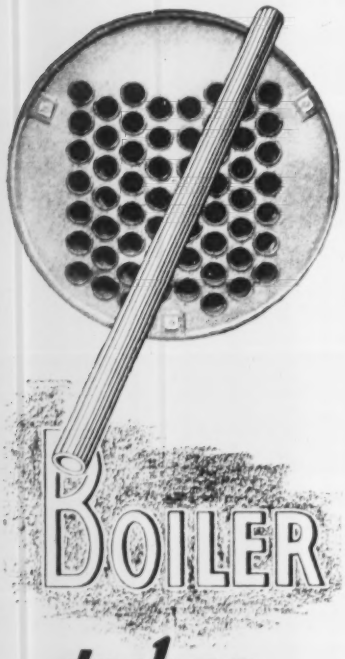

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ter as far as they desire to go, and indications are there will be little, if any, open tonnage before third quarter at earliest.

Chicago—Sheetmakers are of the opinion that were they to open their books for third quarter now it would be necessary to continue customer quotas. The intense demand is coming from all quarters and is baffling in view of essentially unchanged defense requirements and the increase in sheet productive capacity.

Fluorspar . . .

Fluorspar Prices, Page 181

Cleveland—With steel mill operations being pressed at capacity pace demand for flourspar is strong and sellers have little difficulty disposing of their output. Domestic grade metallurgical spar, however, is meeting increasing competition from imported material, especially that coming in from Mexico. Last year something like 130,000 tons of Mexican spar came into this country as against 50,000 to 60,000 tons annually previously. This Mexican spar is quoted around $30 per net ton, duty paid, as against a domestic price of $10 to $13. With freight from the Gulf to Pittsburgh $18.38 the Pittsburgh delivered price on Mexican spar runs around $48 to $49. Spar delivered Pittsburgh from Illinois takes a freight of $10 pushing the delivered price to $53.

Ferroalloys . . .

Ferroalloy Prices, Page 183

Washington—The government has revised its purchase program for small manganese producers to include manganese in the form of furnace slags as well as ores and concentrates. To be accepted under the program, slag must meet the same specifications as ores and concentrates.

Plates . . .

Plate Prices, Page 177

Philadelphia—Plate demand still exceeds supply. Some producers haven't opened books for entire second quarter, but anticipate no difficulty filling schedules on rated orders. This points to the probability no new non-rated tonnage can be handled in the first half as result of the recent open-ending of the Controlled Materials Plan.

Boston—Improved supply of narrow-thin plates is broadening in size ranges, up to 84-inch and 1½-inch thick. Without high ratings heavier plates are not available for second quarter. Application of narrower and odd size plate is limited and some consumers, including warehouses, are holding up strip mill shipments.

New York—Plate producers are confronted with all the rated tonnage they can supply in first half. Some haven't opened their books for the entire period.

Los Angeles—With plate supplies tightening fabricators are displaying interest in Janpanese tonnage made to American gages of good quality at $135 per metric ton laid down at Los Angeles harbor. European plate at $160 per metric ton is not competitive.

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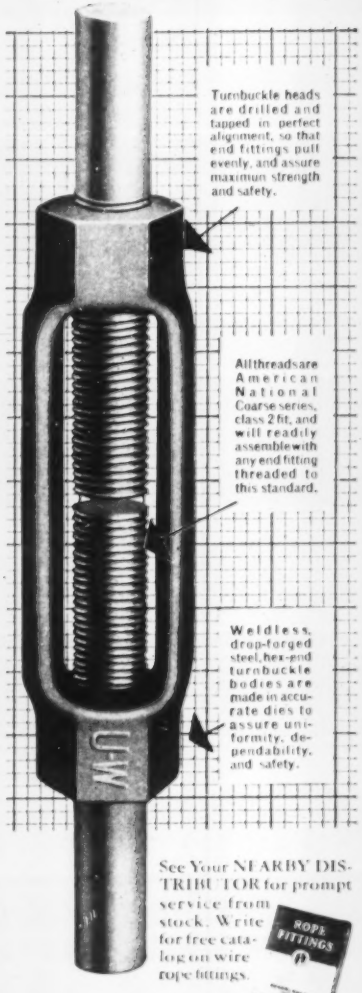
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Wire . . .

Wire Prices, Page 179

Boston—Limited unrated open tonnage will be available in June, mostly in finer sizes, but not until third quarter will wire distribution, outside defense, be in the hands of producers.

Tin Plate . . .

Tin Plate Prices, Page 178

Pittsburgh—While the tin plate market has strengthened some from its former shaky state, the principal can manufacturers are not going to let relaxation of controls inhibit market expansion plans. Both American Can Co. and Continental Can Co. are casting a covetous eye at the soft beverage market. Cans are now being produced for large scale consumer testing this summer.

Tubular Goods . . .

Tubular Goods Prices, Page 181

Washington—Only limited amounts of additional steel will be made available during second quarter to oil and gas operators as result of the open-ending of the Controlled Materials Plan. Second quarter allotments by the Petroleum Administration for Defense and other defense agencies will largely, if not wholly, absorb expected output of line pipe, steel plate, structural shapes and other items used in the oil and gas industries.

Boston—Competition has forced a reduction on smaller sizes of carbon electric welded tubing, leading producers lowering prices 10 per cent. A new mill has started operation at Boston and surplus tonnage is offered by district and New York producers. Stainless tubing is firm. Demand is more in balance with supply.

Structural Shapes . . .

Structural Shape Prices, Page 177

Cleveland—Surge in construction activity is expected with the coming of spring. Structural steel supplies continue tight, especially wide flange beams, but conditions are expected to improve steadily as the weeks pass permitting a large volume of projected work to go ahead.

Currently, public jobs are outstanding in the market. These include contracts totaling $66,070,563 for a proposed $78 million bridge across the Straits of Mackinac in Michigan awarded through the Mackinac Bridge Authority. Merritt-Chapman & Scott Corp. was the successful bidder for the substructure, which involves 34 water piers. American Bridge Division, U.S. Steel Corp., was awarded the contract for the steel superstructure which includes 9304 feet of truss spans and a suspension bridge 8614 feet in length. This latter contract amounts to $41,544,563.

Boston—District fabricating shops are picking up wanted sizes more readily, but deliveries are slightly more extended by heavier bookings, July in more instances. Foreign steel is a factor in fill-in buying. Larger shops are more extended on girder than beam work, November-December and September-October respec-

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tively. Structural mills are not yet absorbing freight.

New York—Several new jobs for the New York state thruway feature structural inquiry. Work includes projects involving 1800 tons, 1700 tons, 1400 tons and 800 tons, bids opening Mar. 26. An outstanding industrial award involves 1110 tons for a manufacturing building for the Tube Reducing Corp., Wallington, N. J.

January structural awards, according to the American Institute of Steel Construction, involved 268,163 tons, increase of 14 per cent over December, 1952, and 26 per cent over the corresponding month last year. Shipments totaled 234,234 tons, up 4 per cent over the previous month. January shipments were below the like month last year, but 6 per cent greater than the average monthly rate of 222,021 tons shipped during 1952. Backlog as of Jan. 31 was 2,179,777 tons.

San Francisco—Construction is expected to begin shortly on a $62 million bridge, Richmond to San Rafael.

Reinforcing Bars . . .

Reinforcing Shape Prices, Page 177

Ft. Worth, Tex.—Texas Steel Co. announced effective with all shipments leaving its plant on Feb. 23, concrete reinforcing bars in stock length were invoiced to all its fabricator and warehouse customers at the following base prices: Rail steel, $5.05, mill zone Tarrant and Dallas counties, $4.85, f.o.b. mill; billet steel, $5.25 mill zone, Tarrant and Dallas counties, $5.05 f.o.b. mill.

Pig Iron . . .

Pig Iron Prices, Page 176

Pittsburgh—If a great demand for pig iron were to develop, some users might feel a temporary pinch. Currently three blast furnaces in the Pittsburgh district are out for relining: For Jones and Laughlin, its the Eliza blast furnace; for U. S. Steel, No. 7 at Edgar Thomson Works, and No. 3 at Duquesne Works. However, foundry activity is slow to reflect any seasonal pickup that might result from spring building activities and a corresponding rise in hardware and plumbing demand.

Cleveland—Merchant pig iron is moving steadily into consumption from the furnaces but demand pressure is off with spotty foundry operations still reported. Over recent weeks foundries on automotive work have been more active and have been taking more iron. To some extent shops turning out castings for the appliance industry also are consuming iron in larger volume. Over-all, however, the situation in the foundry trade is not much changed from earlier in the year and pig iron supply appears adequate for all current needs.

Boston—Although the melt is restricted, shipments of pig iron hold close to production of the Everett furnace. Foundries taking in iron are for the most part correcting their inventory position. Textile equipment shops, operating well below capacity, are taking most of the iron. Machine shops require a steady volume of castings.

Buffalo—Merchant pig iron producers plan to take advantage of one of the earliest openings of the lake navigation season on record. Although demand is equal to current output, merchant iron is being piled as producers await vessels for shipment to upper lake points. General improvement in foundry demand is noted. Sixteen of the district's 17 blast furnaces are active.

Chicago—Most foundries are operating at higher levels. Virtually every user of gray iron castings has ambitious production plans extending beyond first half. Automotive and household appliances are pushing hard and now farm implements are experiencing renewed life. This is keeping pig iron supply nip-and-tuck. No shortage of iron is anticipated, however.

Iron Ore . . .

Iron Ore Prices, Page 183

Cleveland—Navigation is getting under way on the lower lakes for the 1953 shipping season and expectations are one of the earliest openings of the ore shipping season will be seen this year. Automobile cargoes are coming by vessel into Cleveland harbor two weeks ahead of the normal shipping season opening. At the same time a vessel cleared Cleveland harbor last week with a cargo of pig iron for the Ford Motor Co., Detroit.

Scrap . . .

Scrap Prices, Page 184

Philadelphia—Prices are buoyant on high grade steel scrap. Buying in volume for Morrisville, Pa., has been done around $48.50 delivered on No. 1 heavy melting steel and No. 1 bundles with the consumer at this point paying a low phos differential. Railroad lists also reflect strength in the premium grades. The Baltimore & Ohio list of 20,000 tons brought higher than former OPS ceilings on all grades offered and on some grades prices were substantially higher. For instance, crop rail, 18-inches and under, brought $66 delivered to line points, against the former OPS ceiling of $54. Wheels, couplers and knuckles brought $54 against $51. The New York Central obtained $61.50 on crop rail and $54.50 on wheels, couplers and knuckles. Most district steel consumers of open-hearth steel will likely be entering the market shortly as shipments against old contracts are running out. The next few days should somewhat clarify the muddled situation that now exists. Currently No. 2 heavy melting is holding around $43 to $43.50 delivered and No. 1 busheling at $44.50 delivered. The market on No. 2 bundles is weak and purely nominal. Machine shop turnings are quotable at $33.50 to $34 delivered, and mixed borings and turnings and short shovel turnings at $37.50 to $38 delivered. The Bethlehem, Pa., consumer is temporarily holding up shipments on No. 2 heavy melting and bundles. Leading cast grades are unchanged, except for drop broken machinery which is off $2 per ton to $50 delivered.

Pittsburgh—The scrap market is described as in an uncertain position, but the price picture is beginning to clear up. The trend seems to be to keep prices of better grades about

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where they have been, and bid down prices on inferior material. Better grades are moving at former ceiling prices. One of the largest consumers last week announced a substantial purchase of No. 2 bundles at $42, and this generally was considered a representative quotation on this grade despite the fact some buyers were continuing to pay $41. Some indications are that short shovel and mixed turnings may drop to $36 to $37, but no strong purchases are reported to firmly establish the market at that level. Machine shop turnings are quoted $1 lower at $30 to $31, with few takers.

Boston—Re-establishment of old differentials between heavy melting steel and bundle grades with continued weakness in cast mark scrap transactions in this area. In the case of heavy melting, No. 1 is quoted $1 higher and No. 2 heavy melting is off $2, making the spread $3. No. 2 bundles are now $31.17, shipping point. There is little buying of cast at soft prices.

New York—Brokers have revised their buying prices slightly on No. 2 heavy melting steel to $35.50, on machine shop turnings to $25.50, and on mixed borings and turnings to $29.50. Cast iron grades are unchanged.

Buffalo—Confusion prevails over prices in the scrap market here with leading buyers placing business on a delivered basis. Meanwhile, the area's second largest consumer continues to buy at the former government ceiling levels. On a delivered basis local dealers within the switching area realize from $1 to $1.50 per ton more for steelmaking grades. New business placed did not include premium prices for No. 1 material which was placed on the same basis as No. 2. Machine shop turnings also were excluded from new business but borings and turnings were accepted. Cast grades continue weak.

Small quantities of the best grade of steel scrap were reported purchased here last week at $48 per ton, advance of $5 over the former ceiling.

Washington—Export quota of 49,579 short tons of iron and steel scrap has been established for first quarter, the Office of International Trade announced last week. Of this amount, 11,315 short tons are steelmaking scrap, 6161 tons are scrap for lead smelting, and 2100 short tons are copper precipitation scrap. Almost all the scrap exported under this quota is shipped to Mexico. The 49,579 tons compares with a quota of 36,000 tons for each of the third and fourth quarters, 1952.

Cleveland—Some of the uncertainty in the scrap market over prices is clearing away but definite trend of the market remains to be determined by representative new purchases. Steelmaking grades are showing strength, especially quality material.

Detroit—Scrap dealers are growing increasingly optimistic. Deals are reported in which No. 1 grades are offered without price increase on the stipulation No. 2 grades be purchased without decrease. This is tending to hold prices relatively stable. Dealers report scrap is coming into their yards at a greater rate than at any time recently.

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- AB, KC type or straight train line air brakes as specified.

Each car is put into first class operating condition by skilled workmen in Chicago Freight Car's own shops. Built in 1926, these gondola cars will give many years of rugged service. They are priced to give you exceptional values and are ready for prompt delivery.

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Capacity, nominal	100,000 lbs.
Light weight, approx.	48,000 lbs.
Load limit	121,000 lbs.
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scrap has developed here but no important changes in prices are noted except for a decline of $2 per ton on No. 2 bundles. U. S. Steel Corp. placed some orders, but purchases were of only normal tonnages, and the prices paid were former OPS ceilings, except for No. 2 bundles which were down $2 to $42 including broker's commission. No. 1 bundles were purchased at $45, while No. 1 and No. 2 heavy melting moved at $41.

Chicago — Several downward and significant scrap price changes established in transactions last week suggest the market here is going to stabilize without disruptive confusion. The readjustments foreshadow return to normal price differentials between grades. Last week's sales dropped No. 2 heavy melting by $2 a ton, No. 2 bundles by $1.50 and machine shop turnings by close to $2. The mill which set the pattern continues the $43.50 ceiling for No. 1 factory bundles from industry but pegs the same type bundles from dealer yards at $41.

St. Louis — First post-decontrol buying by major scrap consumers disclosed calculated downward pressure on prices. Laclede Steel, for example, paid ceiling and $2 springboard but placed very small orders among many brokers. It passed up bundles entirely, on which there has been special pressure. The technique of buying the least possible until prices drop below ceiling has been aided by heavy shipments. Mills for the first time in two months are receiving more than daily melt.

Seattle — A leading scrap buyer announced last week that all prices are now gross, delivered plant. No freight from remote locations will be absorbed as was done during the shortage last year. Sufficient material is arriving from the immediate area to supply current consumption and provide a surplus. New mill prices are $34 for No. 1 heavy melting, $29 for No. 2, $33 for No. 1 bundles, $27 for No. 2, turnings and borings $25.

Warehouse . . .

Warehouse Prices, Page 183

Boston — More steel is reaching warehouses, and, while inventories frequently approximate 60 per cent of normal, the missing 40 per cent is in products and sizes in heaviest demand, namely carbon sheets in most gages, heavy bars, wide plates and structurals.

Philadelphia — Warehouse operators look for March business to show further improvement. Usually, March and April are among the most active months of the year. Most distributors report February volume exceeded that in January on a day-to-day basis. Increasing demand for hot and cold-rolled sheets is noted.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

220 tons, sub-station work, American Gas & Electric Corp., to Bethlehem Steel Co., Bethlehem, Pa., work comprises 520 tons at Madison, Ind., 735 tons, Cheshire, O., and 620 tons at New Richmond, O.

1110 tons, manufacturing building, Tube Reducing Corp., Wallington, N. J., to B. Kaiden Iron Works, Newark, N. J.

82 tons, four bridges and underpass, Amesbury-Salisbury, Mass., to Grosser & Schlueter Iron Works, Somerville, Mass., through A. V. Taurasi Co., Boston, general contractor.

430 tons, state bridge work, Schenectady county, New York, through Grandview Construction Co., to Ernst Iron Works, Buffalo.

400 tons, hangar, Ft. Sill, Okla., to Capitol Steel & Iron Co., Oklahoma City, Okla., through Harman Construction Co., Oklahoma City, general contractor.

375 tons, freight terminal, Adley Express Co., Bridgeport, Conn., at Cambridge, Mass., to A. O. Wilson Structural Co., Cambridge. Leo F. Caproni, New Haven, engineer.

360 tons, race track grandstand, Talleyville, Del., to the Southern Iron Works, Alexandria, Va.

345 tons, 3-span continuous girder bridge, Saheegan river, Daniel Webster highway, Merrimack, N. H., to Grosser & Schlueter Iron Works, Somerville, Mass., through E. D. Sweet, Winchester, N. H., general contractor.

285 tons, building No. 55, Electro Metallurgical Sales Co., Massetta, O., to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, manufacturing building, Jordon Refrigerator Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

245 tons, hangar and shop, Robins Airfield, Georgia, to Decatur Iron & Steel Co., Decatur, Ill., through Christian & Bell Co., Atlanta, Ga.

200 tons, in addition to 300 tons previously reported, shop addition, Jones & Lamson, Springfield, Vt., to West End Iron Works, Cambridge, Mass.

200 tons, store, Lerner Shops, Indianapolis, Ind., to Geiger & Peters Inc., that city.

160 tons, dormitory group, Syracuse University, Syracuse, N. Y., to Empire Structural Steel Fabricating Co., Syracuse, through Edmond J. Rappoli Co., Inc., Cambridge, Mass., general contractor.

115 tons, state bridge work, Columbia county, New York, through Charter Oak Construction Co., to Pine Brook Iron Works, Scranton, Pa.

100 tons, Spaulding school, Newton, Mass., shapes and bars, to Security Steel & Wire Co., Boston; Rich Bros. Construction Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

12,000 tons, 161 galvanized steel towers and accessories, Chief Joseph-Snohomish transmission 345-KV line, Bethlehem Pacific Coast Steel Corp., San Francisco, low $2,841,106, to Bonneville Power Administration, Portland, Oreg.

4000 tons, bridge, Missouri river, Jefferson City, Mo., bids Mar. 16 to Apr. 2, State Highway Commission, Jefferson City, Mo.

1963 tons, including 1925 tons, schoon bridge, Kingman Lake and Anacostia river, East Capitol street extension, Washington, D. C., bid Apr. 2, director of highways, District of Columbia.

1300 tons, repair shop, naval station, Lakehurst, N. J., Aufderhaide-Aragonne, Newark, N. J., low on general contract.

725 tons, structural shapes and piling, sub-structure, Sakonnet river bridge, Portsmouth-Tiverton, R. I., bids Mar. 19, Providence, state purchased direct approximately 1110 tons additional, Hipping.

255 tons, bar shapes, Corps of Engineers, Pittsburgh.

200 tons, Little Porcupine power plant, Montana, bids to Bureau of Reclamation, Denver, Colo., postponed to June 2. Spec. 947-3552.

195 tons, structurals and bars, state bridge, Bradford, Vt., bids in.

100 tons, intake machinery, Lucky Peak dam, rebids to U. S. Engineer, Seattle, Mar. 11, low first bidder, Berger Engineering Co., Seattle, $91,965, rejected.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2600 tons, two warehouses, Robins Airfield, near Macon, Ga., to Hall Steel Co. and Southern General Freight Co., both Atlanta, Ga., through R. P. Farnsworth Co., New Orleans, La., general contractor.

1400 tons, dormitory group, Syracuse University, Syracuse, N. Y., to Bethlehem Steel Co., Boston, through Edmond J. Rappoli Co., Inc., Cambridge, Mass., general contractor.

270 tons, occupational therapy building, state hospital, Norwich, Conn., to Scherer Steel Co., Hartford, Conn., through Felix Buzzi & Sons, Torrington, Conn., general contractor.

100 tons, bars and structurals, school, North Bridge, Mass., to Joseph T. Ryerson & Son, Inc., and West End Iron Works, both Cambridge, Mass., through John A. Volpe Construction Co., Malden, Mass., general contractor.

REINFORCING BARS PENDING

2000 tons, Little Porcupine power plant, Montana, bids to Denver, Colo., June 2.

1800 tons, New York state thruway, C. T. 53-6, orange county, New York, bids Mar. 26.

1700 tons, state thruway, C. T. 53-6, Genesee county, New York, bids Mar. 26.

1400 tons, state thruway, C. T. 53-5, Genesee county, New York, bids Mar. 26.

500 tons, bridge, Kingman Lake and Anacostia river, East Capitol street extension, Washington, D. C., bids, director of highways, District of Columbia.

500 tons, state thruway, C. T. 53-5, Albany county, New York, bids Mar. 26.

600 tons, bridge, Missouri river, Jefferson City, Mo., bids Mar. 16 to Apr. 2, State Highway Commission, Jefferson City, Mo.

625 tons, Garden State parkway, contract 36, section 7, New Jersey, bids Mar. 26.

600 tons, Garden state parkway, contract No. 45, section No. 7, Middlesex and Monmouth counties, New Jersey, bids Mar. 19.

350 tons, substructure, Sakonnet river bridge, Portsmouth-Tiverton, R. I., bids Mar. 19, Providence, R. I.

325 tons, Bartley diversion dam, Missouri river basin project, near Indianola, Nebr., bids Mar. 10, Bureau of Reclamation, Arapahoe, Nebr.

[illegible] tons, Six Park dam, American river division, Central Valley Project, California, bids in to Department of Interior, Folsom, Calif.

200 tons, ammunition magazine and wash houses, Bangor, Wash., naval base, Hall-Atwater Co., Seattle, low $1,297,000 and $1,343,000, respectively, two schedules, to Thirteenth Naval District, Seattle.

160 tons, state thruway, M. T. 21-5, Montgomery county, New York, bids Mar. 26.

150 tons, mat reinforcement, state highway, New Haven-East Haven, Conn.

110 tons, drainage and pavement, Tolland, Conn., M. A. Gammino Construction Co., Providence, R. I., low.

PLATES . . .

PLATES PLACED

1400 tons, three tanks, Hartol Petroleum Corp., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, diesel engine requirements, American Locomotive Co., Schenectady, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

625 tons, tank work, Copeland Oil Co., Baltimore, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, 1,000,000-gallon water storage tank, Richmond Highlands, to Chicago Bridge & Iron Co., Seattle, low $112,530 to city of Seattle.

200 tons, standpipe, Chattanooga, Tenn., to Chicago Bridge & Iron Works, Chicago.

PLATES PENDING

150 tons, petroleum storage, central fuel transmitter capacity, Corps of Engineers, Galveston, Tex.

100 tons, also other steel, items, classified, project for Atomic Energy Commission, Area Plate, general contract to Utah Construction Co., Salt Lake City, Utah, sub awards pending.

PIPE . . .

STEEL PIPE PENDING

100 tons or more, 210,000 ft. 6-inch, reinforced, Corps of Engineers, Pittsburgh.

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RAILROAD CARS PLACED

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Metalworking Notes

Testing the Skysweeper

Skysweeper, newest and most effective answer of Army Ordnance to the menace of high-speed low-flying aircraft, goes through initial tests at the Aetna-Standard Engineering Co., Ellwood City, Pa. The lethal package combines a 75 mm automatic rapid-fire gun, tracking radar set and computer on one carriage

Kresky Buys Ward Heater

Kresky Mfg. Co., Petaluma, Calif., purchased the Ward Heater Co., Los Angeles.

Buys Canadian Company

Affiliated Gas Equipment Inc., Cleveland, acquired the Toronto Hardware Mfg. Co. Ltd., Toronto, Ont.

Appoints Southern Distributor

Kurt Orban Co. Inc., New York, appointed G. D. Machine Tool Co., Tucker, Ga., as distributor of the company's German-made machine tools in six southern states.

Subsidiary Company Formed

Commercial Shearing & Stamping Co., Youngstown, started a subsidiary company, Commercial Shearing Ltd., Hamilton, Ont., to handle its Canadian business.

Hoover Enters New Plant

Hoover Products Inc., plastic toys manufacturer, moved Youngstown operations into a new $150,000 plant.

Plans Manufacturing Center

A Pasadena, Calif., electronic instruments company, Consolidated Engineering Corp., plans to develop a 20-acre instrument manufacturing center with a "campus atmosphere" near its present plant.

Warehouse for Western States

Standard Pressed Steel Co., Jenkintown, Pa., opened a warehouse near Los Angeles, to service 11 states and British Columbia.

Rubber Research Planned

U. S. Rubber Co. plans to create a research center on an 80-acre site in Emerson, N. J.

Heads Metal Lath Group

G. J. Casey was elected to his second term as president of the Metal Lath Manufacturers Association at the annual meeting in Cleveland. Mr. Casey has spent 30 years with Truscon Steel Division of Republic Steel Corp., the last 11 years as sales manager of the corporation's metal lath division.

Plans Canadian Mining

North Range Mining Co., Negaunee, Mich., is planning development of an iron mining area at Sapawe, Ont.

Old Town Stock Purchased

James H. McGraw Jr., former chairman and president of McGraw-Hill Publishing Co. Inc., purchased a majority of the common stock of Old

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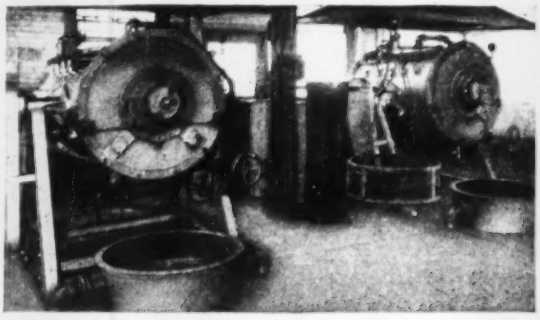

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Town Corp., New York manufacturer of typewriter ribbons, carbons and duplicating equipment.

Heads Road Builders

Robert M. Reindollar, consulting engineer of Baltimore, was elected president of the American Road Builders' Association at its convention in Boston.

Opens Dallas Sales Office

Maintenance Engineering Corp. will open a Dallas office to be sales representative in northern Texas for Lukens Steel Co., Coatesville, Pa.

American Sterilizer Buys Site

American Sterilizer Co., Erie, Pa., is buying 56 acres of property in Erie to erect a $1 million plant over a period of five years. The company produces hospital and surgical equipment.

Appoints Chain Distributor

Atlas Chain & Mfg. Co., Philadelphia, appointed Warren M. Pike Associates Inc., Boston, as master distributors of Atlas Chain for metropolitan Boston.

To Build in Los Angeles

Associated Coil Spring Co., New York, will build a factory in Los Angeles on a 60,000-square-foot site.

Warehouse To Serve Texas

Industrial Tape Corp., New Brunswick, N. J., opened new warehousing facilities in Dallas to serve markets in Texas and surrounding areas.

Toronto Plant Begun

Canadian Stackpole Ltd., subsidiary of Carbon Co. Inc., St. Marys, Pa., began construction of a plant in Toronto, Ont., to produce electronic components for radio and television.

Allis-Chalmers Names Agent

Roche & Hull Inc., Baltimore, was named by Allis-Chalmers Mfg. Co., Milwaukee, as a distributor for its pumps.

Benada Aluminum Expands

Benada Aluminum Co., Girard, O., is undergoing an expansion program which will add 87,000 square feet of floor space and triple company personnel within one year.

Atlas Buys Office Site

Atlas Powder Co., Wilmington, Del., acquired about 15 acres of land near Wilmington, to construct an office building.

Installs Lining Facilities

The plant of Frederic B. Stevens Inc., New Haven, Conn., installed complete facilities for rubber or Koroseal lining all types of plating tanks.

More Fabricating Facilities

Engineering Corp. of America, designers and builders of special mechanical and process equipment, with offices at Westfield, N. J., acquired additional plant fabricating facilities in Garwood, N. J.

Foundry Passes Tests

The Utica Radiator Corp. foundry, Utica, N. Y., has undergone a successful trial operation but regular operation will not be underway until mid-March or early April.

Cambridge Opens New Office

Cambridge Wire Cloth Co., Cambridge, Md., opened a new southern sales territory with headquarters in Atlanta.

Award Bridge Contract

The Northern Pacific Railroad awarded the second phase of the $1 million Columbia river bridge raising project to Kansas City Bridge Co. and Massman Construction Co., Kansas City, Mo., for moving the spans to new piers and replacing the draw span.

Luria Builds Warehouse

Luria Engineering Co. is erecting a 12,000-square-foot warehouse for the Wilmington Paper & Twine Co. in Wilmington, Del.

Names Rochester Representative

Rivett Lathe & Grinder Inc., Boston, appointed Genesee Machine Builders Inc., Rochester, N. Y., as representative in the Rochester area.

Joins Trade Association

Marve Narramore joined the Drop Forging Association, Cleveland, a national trade association representing interests of the commercial drop forging industry. Mr. Narramore is staff assistant.

New Division of Remington Rand

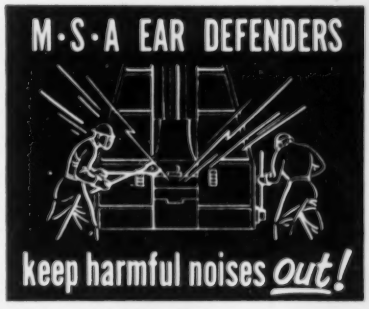
Engineering Research Associates of St. Paul and Arlington, Va., is now a division of Remington Rand Inc., New York.

Sylvania Plans Construction

Sylvania Electric Products Inc. plans to build a $1.4 million engineering laboratory near Williamsport, Pa., with construction starting in May or June.

Appoints New Distributor

Clearing Machine Corp., Chicago manufacturer of hydraulic and mechanical presses, appointed the Sater-



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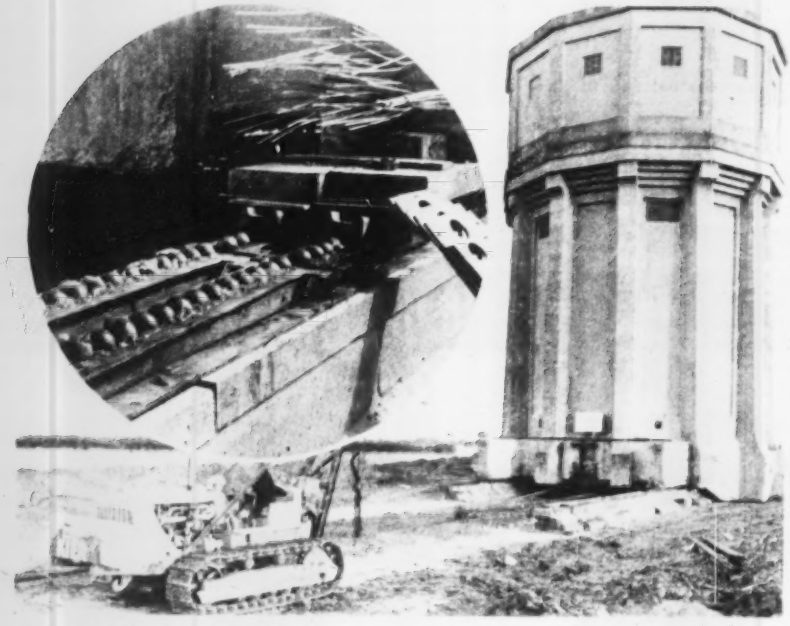

Rolling Water Tower

When the Bedford Rural District Council, England, decided to move a 1900-ton water tower 300 yards, steel balls and a Caterpillar D7 diesel tractor made possible the hard pull. The tower was rolled to its new location on steel bearings rolling in a race made from ordinary bullhead section railroad lines laid on their sides and resting on a movable precast concrete block. The D7 pulled the tower through a 10-to-one block and tackle reduction to exert a 50-ton pull

lee Co., Minneapolis, as a distributor in that area.

Begins Oxygen Deliveries

Air Reduction Sales Co.'s newly completed liquid oxygen plant in Butler, Pa., has begun delivery of oxygen to industrial customers.

Sheridan Purchases Yard

Sheridan Scrap Iron & Metal Co. purchased the scrap yard of the Columbia Metal & Iron Scrap Co., Pittsburgh.

Error Noted

An item in these pages in the Feb. 9 issue erroneously reported that Twin Coach Co., Buffalo, plans to install about $1 million worth of new machinery in 1953 to handle a multi-million dollar aircraft order. Twin Coach contemplates purchasing replacement equipment only during 1953.

Adds to Geigy Plant

Luria Engineering Co. finished construction of a 12,000-square-foot addition to the Leland, Miss., factory of Geigy Co. Inc.

Lehigh Plans Conference

Eight national organizations will join Lehigh University's department of mechanical engineering in sponsoring a two-day conference on trends in year-round residential air conditioning. The sessions will begin Apr. 24 at the Bethlehem, Pa., school.

To Open California Plant

Lindberg Engineering Co., Chicago, will open a new plant in Downey, Calif., Mar. 25.

Westinghouse Plant Projected

Westinghouse Electric Corp. has plans for a multi-million dollar plant to produce atomic equipment. The plant, to be operated by the Westinghouse atomic equipment department, will be located near Pittsburgh.

Opens Indiana Plant

Pittsburgh Plate Glass Co.'s fiber glass division began production in its new facilities at Shelbyville, Ind.

Buys Plant Site

A 25-acre plot was purchased by Cleveland Cap Screw Co. as a site for a new Cleveland plant.

Employs Long Conveyor

U. S. Steel Corp. put one of the world's longest single-flight rubber and fabric constructed conveyor belts into operation between the coking plant and blast furnaces at its Fairless Works in Morrisville, Pa. The belt, measuring 5500 feet from the center of the head pulley to the center of the tail pulley, was built by Goodyear Tire & Rubber Co., Akron.

Douglas Adds Facilities

Douglas Aircraft Co. Inc., Santa Monica, Calif., will add $2 million of facilities to its plant in Long Beach, Calif.

Lockheed To Expand

Lockheed Aircraft Corp., Burbank, Calif., will add $3 million of factory facilities to increase production of large aircraft. Construction is sched-

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Hoppers, Twin, All Steel, 50-Ton, Cross Dump
Tank, 3,000 Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

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Side Dump, 20-Yd., 40-Ton, Lift Door

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uled by Mar. 1 and completion is planned early next year.

Changes Plant Location

The new location of Glazer Steel Corp.'s plant and offices in New Orleans is 1556 Tchoupitoulas St.

Welding Clinic Planned

Steel Sales Corp. of Chicago reports that a three-day welding clinic will be held in connection with the formal opening of its Indianapolis warehouse. The clinic will begin Apr. 15.

Hamilton Opens New Division

Hamilton Watch Co., Lancaster, Pa., set up an allied products division to develop, produce and market new products.

Canadian Expansion Planned

Chrysler Corp. of Canada Ltd. will begin a $17 million expansion program immediately at its works in Windsor, Ont.

Thor Adds New Products

Thor Corp., Chicago, added electric ranges to its appliance line through acquisition of Leeson Steel Products Co., New Albany, Ind.

Elected by Plate Fabricators

J. A. Stever Jr., executive vice president of National Tank & Mfg. Co., Los Angeles, was elected a regional vice president of the Steel Plate Fabricators Association in a recent meeting.

Plans Research Laboratory

Allied Chemical & Dye Corp.'s general chemical division plans to build a large research laboratory at Morristown, N. J.

Receive Management Awards

The American Institute of Management awarded certificates of management excellence for 1952 to six steel companies: Acme Steel Co., Inland Steel Co. and Signode Steel Strapping Co., all of Chicago; Allegheny Ludlum Steel Corp. and National Steel Corp., both of Pittsburgh, and Bethlehem Steel Corp., Bethlehem, Pa.

Heads Cast Iron Pipe Group

The Cast Iron Soil Pipe Institute elected J. W. Struve of Los Angeles as president for 1953.

Koehring Names Distributors

Koehring Co., Milwaukee, appointed distributors for territories in Wisconsin, California and Florida. The companies appointed are Kelbe Bros. Equipment Co., Milwaukee, Allied Equipment Inc., Miami, Fla. and Standard Machinery Co., San Francisco.

Prepares for Youngstown Plant

Metal Carbides Corp. is clearing a 17-acre site in Youngstown for construction of a $1 million plant.

Merging Resources

Sintering Machinery Corp., Netcong, N. J., and Equipment Development Co. Inc., Montclair, N. J., agreed to join in production and sale of filtration equipment to be marketed under the trade name of "Edco-Sintering."

Wins Achievement Award

H. Thomas Hallowell Jr., president of Standard Pressed Steel Co., Jenkintown, Pa., was named to receive the 1952 achievement award of the National Metal Trades Association for outstanding contributions in industrial relations.

Harbison-Walker Makes Change

The Warm Springs, Calif., plant of Harbison-Walker Refractories Co. is completely converted to production of chemically bonded basic refractories.

Champion Builds in Ohio

Champion Spark Plug Co. will build a $1.5 million plant employing between 200 and 400 persons in Cambridge, O.

Company Name Changed

Harry Harris & Co., Kearny, N. J., changed the company name to Harris Steel Co.

Becomes Inland Division

Inland Steel Container Co., Chicago, became a division of the parent company, Inland Steel Co., on Mar. 1. Inland Steel Container has been a wholly-owned subsidiary corporation of Inland Steel since 1939.

Harvell Undertakes Move

Harvell Mfg. Corp. is moving its offices and plants from LaPorte, Ind. to Hubbard, O., a suburb of Youngstown, the company announces. Harvell manufactures metal wastebaskets, wax paper and paper towel dispensers.

Lang Named Representative

Lang Co., steel fabricators and equipment suppliers in Salt Lake City, Utah, has been appointed exclusive industrial sales representative for Chiksan Co., Brea, Calif., in the states of Utah and Idaho.

To Enter Air Conditioning

Dayton Pump & Mfg. Co., Dayton, O., announced it will enter the air conditioning field.

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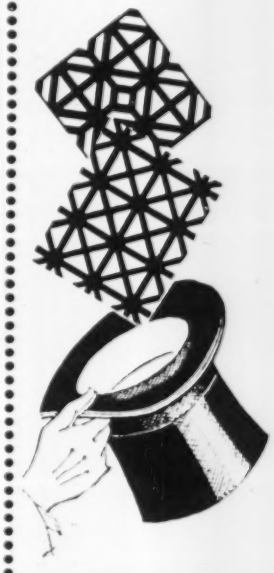

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Whether you require grilles for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers or similar applications — you can be sure there's a Hendrick Ornametal design to fit your job to a tee!

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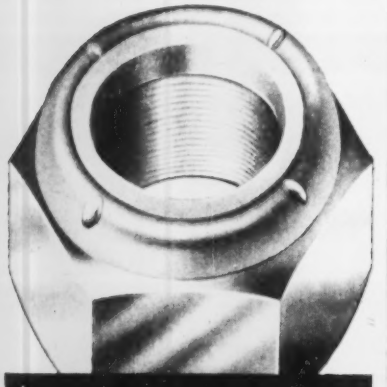

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Stop Nuts

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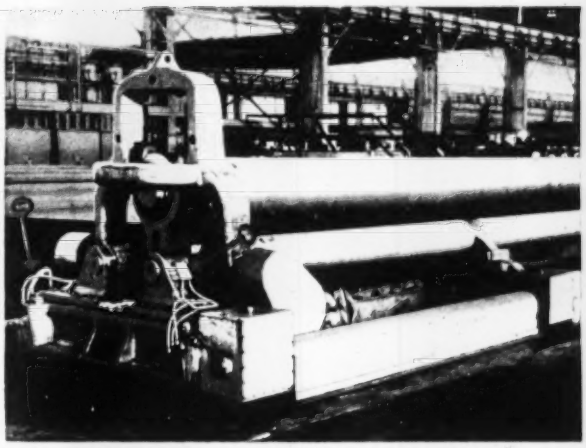
No. 140

800 miles of pipe rolled on Baldwin Bending Roll lubricated by Farval



KEYS TO ADEQUATE LUBRICATION—*Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

FARVAL SAVES ON BENDING ROLL LUBRICATION

	Lbs./yr. lube. 62 points	Hrs./yr. lube. 62 points	Annual Cost @ $1.50/hr. 62 points
GREASE GUN	20,592 lbs.	717 hrs.	$1,075.00
CENTRALIZED SYSTEM	5,304 lbs.	15 hrs.	$ 22.50
ANNUAL SAVINGS EFFECTED BY FARVAL	15,288 lbs.	702 hrs.	$1,051.50
COMBINED SAVING (LABOR AND LUBRICANT)			$2,579.50

AND IN ADDITION, FARVAL SAVES BEARING EXPENSE AND PRODUCTION TIME

Reports of lubrication engineers show lubrication by grease gun takes .747 minutes per point—to clean dirt from nipples, grease, move from point to point, and refill gun. With Farval it takes only 15 minutes every fourth day to refill Farval reservoir. In addition, Farval saves 4 pounds of each 4 of lubricant used by other methods.

THIS first of a new type bending roll formed over 800 miles of 24" and 30" O.D. pipe its first operating year. At work in a large southern pipe mill, it shapes 31½ foot lengths of 78" and 97" skelp at rolling speeds up to 60 feet per minute.

To insure that the new design features for increased production would not be hamstrung by old-fashioned hand lubrication, the machine builder equipped the bending roll with Farval centralized lubrication.

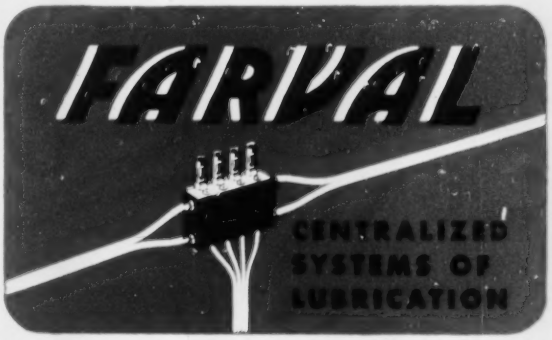
At a single stroke Farval lubricates 62 main bearings on which depends the rugged job of shaping skelp. No stopping for time-consuming hand oiling! Lubricant savings run as high as 75%.

Farval is the original Dualine system of centralized lubrication that delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Indicators at every bearing tell that each valve has functioned.

Machinery builders and customers alike recognize that Farval centralized systems of lubrication save time, money and lubricant, as well as eliminate bearing expense and increase machine production.

There are Farval systems for your machines, big or small, with proportionate savings. And there's a Farval engineer near you, ready to solve your lubrication problems. Write for full details. Send for Bulletin 25 today. The Farval Corporation, 5270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



HEAVY PLATE LEVELERS

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BONDERIZING EQUIPMENT

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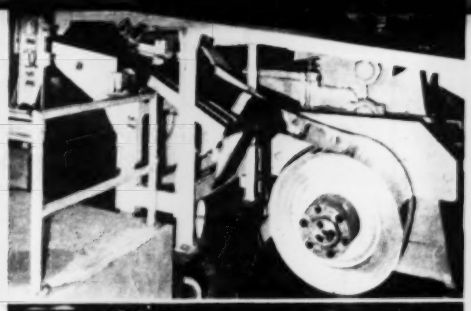

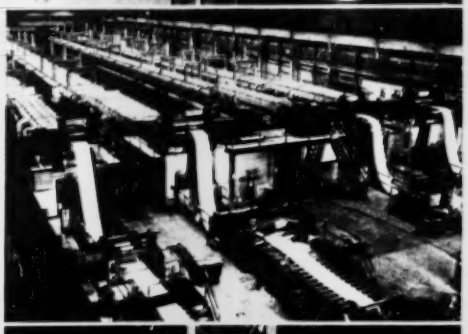

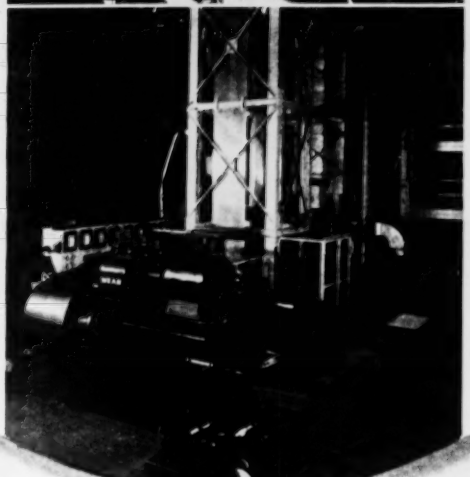

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STAINLESS STEEL PROCESSING LINES

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